

CHAPTER 5

ANTI-EXPOSURE ASSEMBLIES

Section 5-1. Description

5-1. GENERAL.

5-2. This chapter covers constant wear and quick donning anti-exposure assemblies. Anti-exposure assemblies are designed to protect the aircrewmember or passengers from exposure to cold water conditions in the event of immersion. The constant wear assemblies provide additional protection from cold weather.

NOTE

Naval Air Systems Command (NAVAIR-SYSCOM) has issued messages entitled, Cold Weather Protective Clothing, which authorize procurement and use of items of supplemental cold weather clothing configurations. These messages identify acceptable items which provide cold weather protection, their procurement sources, and information for procurement and use. These items are known as Non-Developmental Items (NDI) which meet or exceed Navy performance requirements when worn with items of clothing currently authorized for use.

NDI items procured under authority of cold weather protective clothing messages should be maintained and cared for in accordance with manufacturer's instructions accompanying the item.

5-3. CONFIGURATION.

5-4. CONSTANT WEAR ASSEMBLIES. The constant wear assemblies consist of a waterproof outer garment worn over cold weather underwear. Specific configurations for the various assemblies are outlined in the applicable section.

5-5. QUICK DONNING ASSEMBLY. The Quick Donning Anti-Exposure Coverall, CWU-60/P, consists

of a waterproof outer garment with attached mittens/gloves, hood, and boots. An inflatable hood is stowed in the pocket of the coverall. In case of an emergency, the CWU-60/P assembly is donned over the flight coverall, CWU-45/P Extreme Cold Weather Jacket and CWU-18/P Extreme Cold Weather Trousers. The Survival/Flotation Vest Assembly shall be worn over the CWU-60/P coverall and the helmet shall be worn under the CWU-60/P Hood Assembly.

5-6. PASSENGER ASSEMBLY. There is an assembly designed to be worn over a uniform or civilian clothes for passengers of fixed wing and rotary aircraft. All passengers shall don the assembly prior to boarding the aircraft.

5-7. APPLICATION.

5-8. The latest available type continuous wear or quick donning anti-exposure suits, as appropriate, shall be provided for flight personnel and passengers of operational type naval aircraft when in the event of a mishap there would be a significant risk of water entry and when any of the following conditions prevail:

1. The water temperature is 50°F or below.
2. The outside air temperature (OAT) is 32°F (wind chill factor corrected) or below.

5-9. If the water temperature is between 50° and 60°F, the commanding officer of the unit concerned must make an assessment based on search and rescue (SAR) factors as follows:

1. Assess the maximum probable rescue time. This should be a function of mission distance, SAR equipment and SAR location.

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2. Determine the worst water temperature that will occur in the mission area during the time period of the flight.

3. Using [figure 5-1](#) determine whether anti-exposure suits are required.

4. When water temperature is below 60°F and anti-exposure suits are not required, flight equipment ensemble shall include anti-exposure, aramid, high temperature-resistant undergarments. The wearing of double layers of these garments can significantly improve anti-exposure performance and should be encouraged.

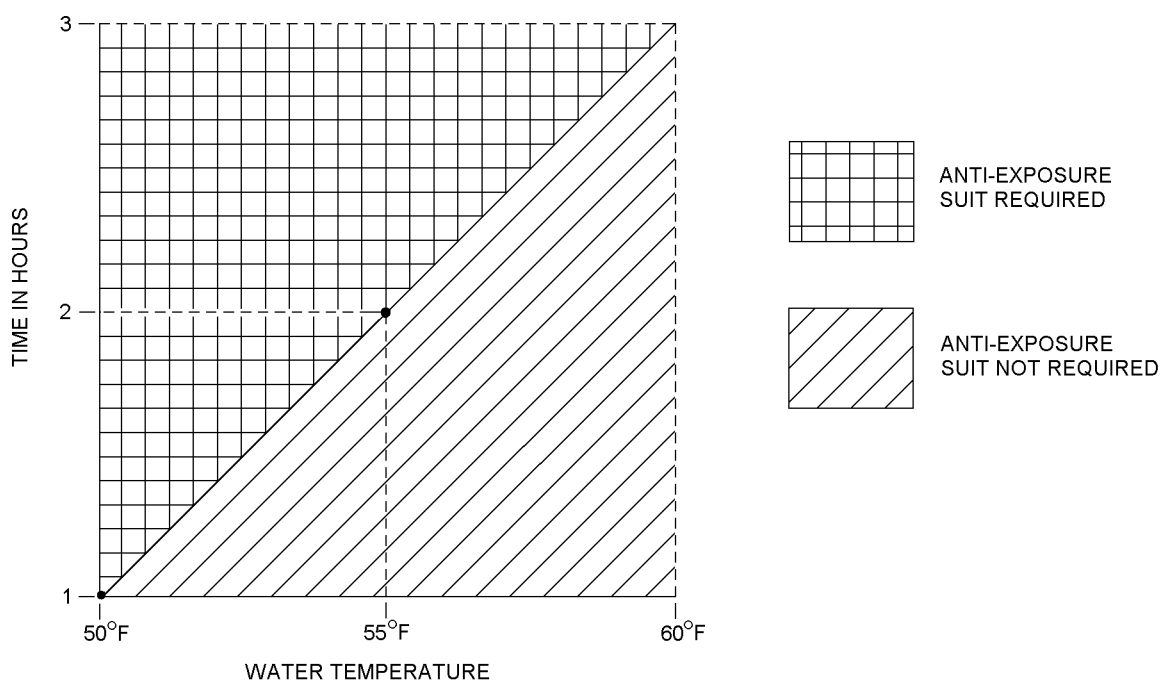


Figure 5-1. Anti-Exposure Suit Requirements

5-1

Section 5-2. A/P22P-17 Anti-Exposure Apparel Assembly

5-10. GENERAL.

5-11. The A/P22P-17 Anti-Exposure Apparel Assembly, which is comprised of the CWU-79/P Passenger Anti-Exposure Survival System (PAESS), is designed to provide cold weather/water protection for non-combat equipped passengers. The ensemble will be used on Carrier Onboard Delivery (COD) and Vertical Onboard Delivery (VOD) aircraft on flights over water or where cold climatic conditions could be hazardous or fatal should emergency egress be necessary.

5-12. There are two sources providing the PAESS to the fleet. Four hundred fifty (450) ensembles were fabricated in accordance with Aircrew Systems Change 613 by selected fleet activities and designated CWU-79/P1. One thousand (1000) size 12 CWU-62/P Series Coveralls were modified to CWU-79/P configuration by commercial contract. All reference to the ensemble shall be CWU-79/P Series.

5-13. CONFIGURATION.

5-14. CWU-79/P PASSENGER ANTI-EXPOSURE SURVIVAL SYSTEM (PAESS) (figure 5-2). The PAESS was designed to meet OPNAV requirements for anti-exposure protection for non-troop, non-aircrew personnel on Carrier Onboard Delivery/Vertical Onboard Delivery (COD/VOD) missions when anti-exposure protection is required for the aircrew. The suit is a modified size 12 CWU-62A/P anti-exposure coverall. It is made of a laminate composed of inner and outer layers of fire-resistant aramid cloth. It is a lightweight coverall that will prevent water from leaking through it from the outside, but which will allow body moisture to pass out, thereby lessening heat and moisture buildup. The CWU-79/P has an attached hood and there are adjustment straps on each side of the torso which will enable the coverall to fit passengers of various sizes. The coverall has wrist seals and a neck seal that are made of gas-expanded neoprene which are adjustable to most sizes. A pocket on the right thigh provides stowage for the HAU-12/P Anti-Exposure Mittens and HGU-32/P Anti-Exposure Hood. CWU-75/P Anti-Exposure Socks are attached as an integral part of the assembly. The

PAESS will provide protection from immersion hypothermia when worn over regular winter uniforms or civilian street clothing.

5-15. CWU-75/P ANTI-EXPOSURE SOCKS. Anti-exposure socks made of waterproof, stretchable fabric are attached to the legs of the CWU-79/P coverall.

5-16. PAESS SUPPLEMENTAL COMPONENTS. The HGU-32/P Anti-Exposure Hood (Section 3-17A) and HAU-12/P Anti-Exposure Mittens (Section 3-27A) are supplemental components of the PAESS system.

NOTE

The anti-exposure hood and mittens may need to be added to the CWU-79/P Series coveralls prior to issue.

5-17. APPLICATION.

5-18. When authorized by the Type Commander, the A/P22P-17 Anti-Exposure Apparel Assembly shall be worn aboard COD/VOD aircraft when anti-exposure protection is required for the aircrew. The A/P22P-17 assembly shall be worn by passengers for flight operations in accordance with the climatic and operational requirements established by the NATOPS General Flight and Operational Instructions Manual OPNAVINST 3710.7 Series.

5-19. MODIFICATIONS.

5-20. There currently are no modifications for the A/P22P-17 Anti-Exposure Apparel Assembly.

5-21. FITTING.

5-22. The CWU-79/P coverall is available in one size only, but it can be adjusted to fit by use of adjustable straps located on either side of the waist area. These straps help to maintain the best possible fit and to reduce bulk. Further, both the neck and wrist seals are adjustable and will minimize water entry when properly tightened.

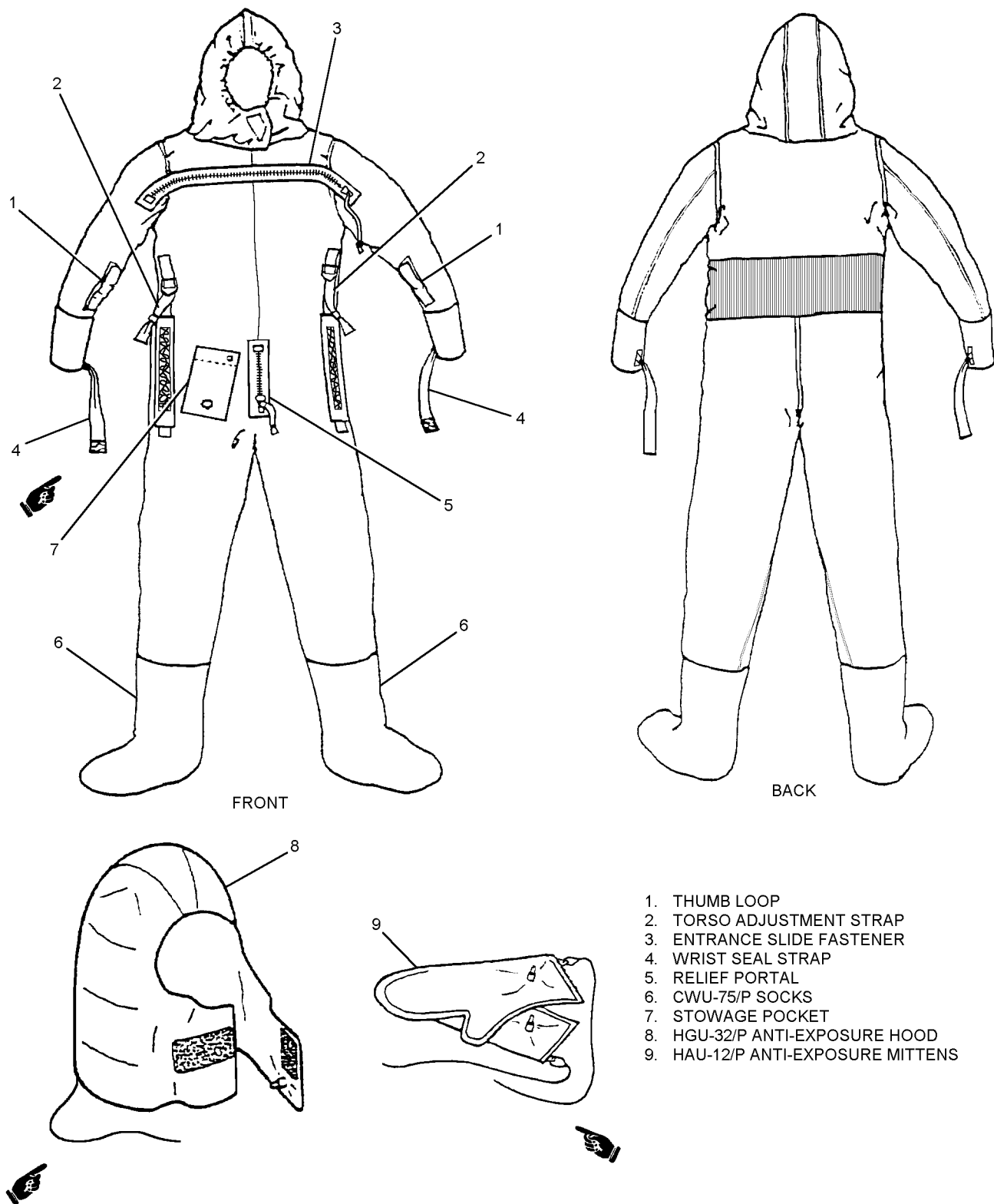


Figure 5-2. CWU-79/P Passenger Anti-Exposure Survival System (PAESS)

5-23. DONNING.

5-24. Don the A/P22P-17 assembly as follows:

NOTE

The A/P22P-17 is worn over passenger clothing. The anti-exposure hood and mittens are not worn during flight but remain stowed in the coverall thigh pocket.

1. Remove shoes/boots.
2. Don CWU-79/P coverall by first inserting feet into anti-exposure socks, then pull coverall up past waist.
3. Insert arms into sleeves.
4. Grasp upper part of coverall (behind head) and pull neck seal over head. Adjust neck seal so it is comfortable and seam tapes are aligned with shoulders.
5. Release thumb loops from hook and pile fastener tapes on sleeves.
 - a. Place right loop over right thumb and extend right arm horizontally to side of body. Grasp entrance opening slide fastener with left hand and close fastener to a point past center of chest. Remove right thumb from loop.
 - b. Place left thumb in left sleeve loop and extend arm horizontally to side of body. Grasp slide fastener pull tab in right hand and completely close entrance slide fastener. Ensure pull tab is firmly seated into seal block and butted against end block.
 - c. Remove thumb from thumb loop and mate fastener tapes of both loops with fastener tapes on sleeves.
6. Ensure relief portal slide fastener is closed. Ensure pull tab is firmly seated into seal block and butted against end block.
7. Manually vent air from the suit by squatting at the knees and bending forward while pulling the neck seal away from the neck as you squat.

8. If coverall appears baggy, take up excess material by pulling straps located on either side of the torso and secure straps in position using hook and pile fastener.

9. Adjust tightness of wrist seals by using straps on each wrist.

10. Don life preserver and helmet in accordance with aircrewman's instructions.

5-25. DOFFING.

5-26. To doff the A/P22P-17/P assembly carefully proceed as follows:

1. Remove life preserver, hood, and mittens, as applicable.
 - a. Stow hood and mittens in coverall thigh pocket.
2. Loosen adjustment straps on each side of torso.
3. Loosen wrist seal adjustment straps.
4. Release thumb loops on each sleeve from hook and pile fasteners.
 - a. Insert left thumb in left loop and extend left arm horizontally to side.
 - b. Grasp entrance slide fastener pull tab in right hand and open slide fastener past center of chest. Remove left thumb from loop.
 - c. Insert right thumb in right loop and extend right arm horizontally to side.
 - d. Grasp entrance slide fastener pull tab in left hand and completely open slide fastener. Remove right thumb from loop.
5. Grasp upper portion of coverall and pull up over head.
6. Pull sleeves inside out while pulling arms from sleeves.

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7. Peel coverall down, turning it inside out down below the waist.

8. Remove legs and feet from coverall.

5-27. MAINTENANCE.

5-28. Maintenance of the CWU-79/P consists of inspection, cleaning, repair and replacement. Repair and replacement functions for the CWU-79/P shall be accomplished at the intermediate level or above. All maintenance actions shall be documented in accordance with OPNAVINST 4790.2 Series. In addition, a Damage Chart (figure 5-3) shall be maintained for each CWU-79/P coverall. The damage chart is intended as an aid to organizational maintenance technicians in describing needed repairs by intermediate level personnel. Intermediate level technicians shall use the damage chart as an aid during inspection.

NOTE

Stitching wrist seals, neck seals, and attaching CWU-75/P socks to the CWU-79/P coveralls may be performed at organizational level providing heat sealing and water tests are performed at intermediate level.

Quality Assurance Inspection (QA) requirements are included in inspection, repair, and replacement procedures. When a procedure is underlined, an authorized QA representative shall verify that the procedure was correctly accomplished before the next step can be performed.

5-29. INSPECTION. Inspection requirements of the CWU-79/P Passenger Anti-Exposure Survival System (PAESS) shall include Preflight, Postflight, Place-In-Service, and 360-Day inspections.

5-30. Preflight Inspection. The Preflight Inspection is a visual inspection which shall be performed by an

assigned aircrewmember who will inspect and issue a coverall assembly to each passenger prior to each flight as follows:

1. Slide fasteners for proper function and ease of operation.
2. Seams for loose tape, separation, cuts and tears.
3. Neck and wrist seals for damage and proper bonding to coverall.
4. Socks for attachment to coverall.
5. The overall assembly for cuts, tears, abrasions, and deterioration.

5-31. Postflight Inspection. Perform Postflight Inspection in accordance with paragraph 5-30, Preflight Inspection, and as follows:

1. After inspection hang coverall on a wooden or plastic hanger, inside out.
2. Allow to air dry in a cool, dry, well ventilated area.

NOTE

Although there is no requirement for anti-exposure suits to be inspected at certain times of the year, the best maintenance practices for the suits is to time the inspections of the anti-exposure suits so that the 360-Day Inspection is being done as the suit is taken out of seasonal storage in the fall. See paragraph 5-96 for storage requirements and storage clarification.

5-32. Place-In-Service Inspection. The Place-In-Service Inspection shall be performed prior to placing in service when issued and upon removal from any long term storage. The Place-In-Service Inspection shall be performed in accordance with paragraph 5-33, 360-Day Inspection.

(ORGANIZATIONAL USE) _____ DATE _____
 ACTIVITY/SQN. _____ COVERALL SERIAL NO. _____ C.D.I. _____
 REMARKS: _____

(INTERMEDIATE USE)
 INSPECTION/TEST REMARKS: _____

REPAIR REMARKS: _____

REPAIRED BY _____ INSPECTOR _____ DATE _____

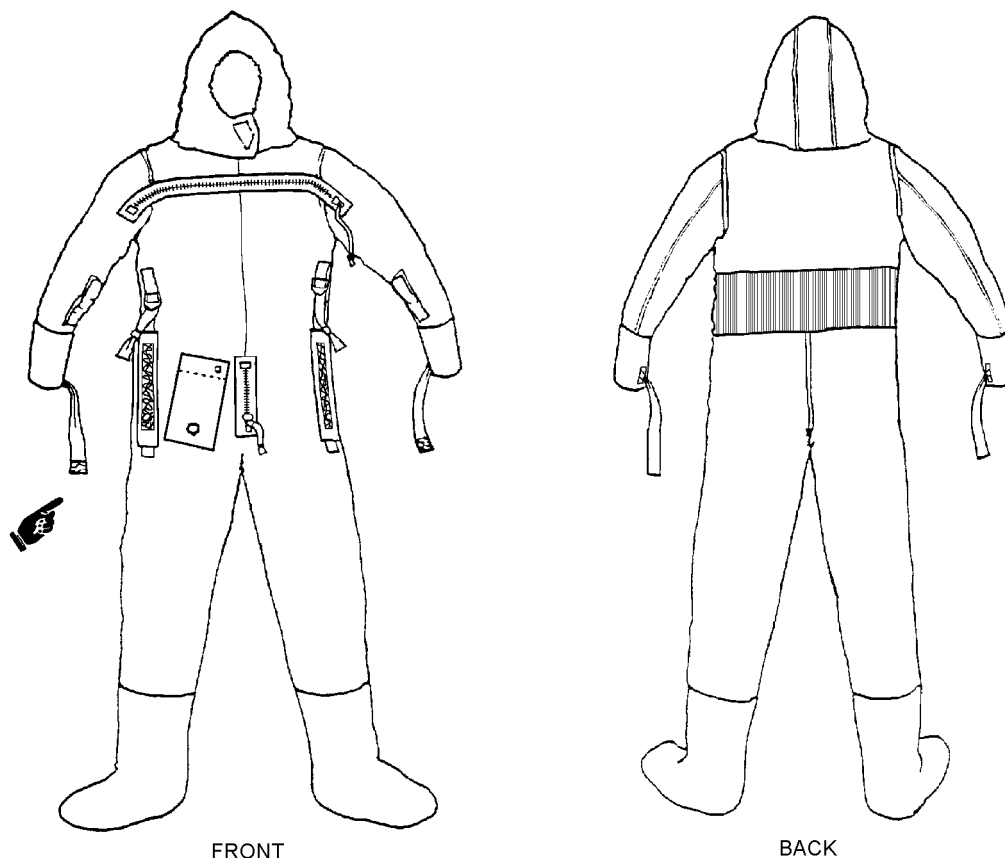


Figure 5-3. CWU-79/P Series PAESS Coverall Damage Chart (Sheet 1 of 2)

5-3-1

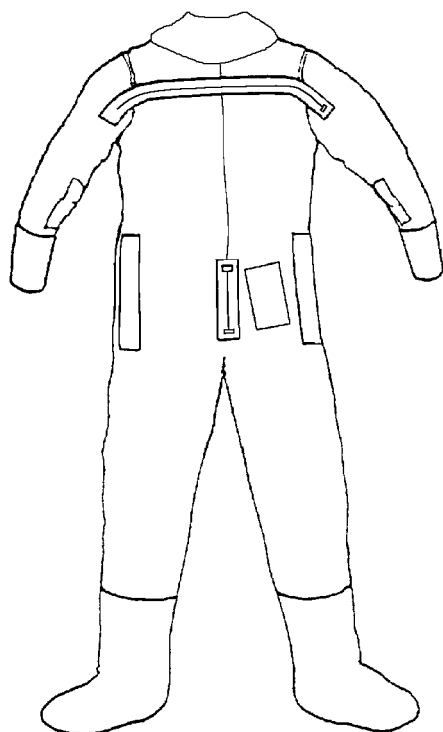
(ORGANIZATIONAL USE) _____ DATE _____
 ACTIVITY/SQN. _____ COVERALL SERIAL NO. _____ C.D.I. _____
 REMARKS: _____

(INTERMEDIATE USE)
 INSPECTION/TEST REMARKS: _____

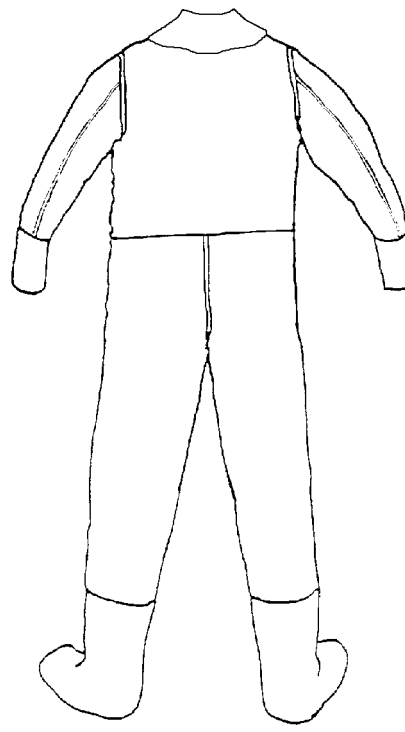
REPAIR REMARKS: _____

REPAIRED BY _____ INSPECTOR _____ DATE _____

COVERALL SHOWN INSIDEOUT



FRONT



BACK

Figure 5-3. CWU-79/P Series PAESS Coverall Damage Chart (Sheet 2 of 2)

5-3-2

5-33. 360-Day Inspection. The 360-Day Inspection shall be performed at intermediate level on all in-service A/P22P-17 assemblies as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Lubricant Stick	Zipperease NIIN 00-999-7548

NOTE

For inspection of HGU-32/P Anti-Exposure Hood refer to [Section 3-17A](#) and [Section 3-27A](#) for inspection of HAU-12/P Anti-Exposure Mittens.

1. If required, clean components in accordance with [paragraph 5-93](#).

2. Place coverall assembly on clean, flat surface and inspect as follows:

a. Inspect coverall surface, wrist seals, neck seal, and socks for damaged fabric, holes, and loose or broken stitching.

b. Inspect slide fasteners for damaged chain, loose teeth, improper chain alignment, damaged or split end seal blocks, damaged or missing pull tabs (metal and fabric), ease of operation, and loose slide fastener tape.

c. Turn coverall inside out, repeat steps a and b, and inspect seam tapes for security and fraying.

d. Using lubricant stick, apply coating of lubricant to slide fastener.

e. Repair in accordance with [paragraph 5-97](#), [5-116](#), and [table 5-8](#).

f. Water test in accordance with [paragraph 5-91](#).

3. Document inspection and maintenance actions in accordance with OPNAVINST 4790.2 Series.

5-34. SERVICE LIFE. The CWU-79/P coverall shall remain in service until it is beyond economical repair.

For service life data on the HGU-32/P Hood and HAU-12/P Mittens refer to [Sections 3-17A](#) and [3-27A](#) respectively.

5-35. CLEANING. Clean and treat the CWU-79/P coveralls in accordance with [paragraph 5-93](#). Refer to [Sections 3-17A](#) and [3-27A](#) for cleaning requirements of HGU-32/P Hood and HAU-12/P Mittens.

5-36. REPAIRS/REPLACEMENT/FABRICATIONS. Repairs, replacements, and fabrications shall be performed at intermediate level of maintenance.

5-37. Repairs. Fabric repairs shall be in accordance with [paragraph 5-97](#).

5-38. CWU-79/P Pre-installation Inspection of Replacement Neck and Wrist Seals. Replacement neck and wrist seals for the CWU-79/P anti-exposure coveralls are assigned a shelf life of three years. However, they may still be serviceable beyond the assigned expiration date. All neck seals (P/N 3497AS105-1, NIIN 01-449-8918) and wrist seals (Pair P/N 3497AS104-3, NIIN 01-449-8920) may be installed regardless of expiration date only after passing the following inspection to determine their usability.

1. Inspect wrist seal in the following manner:

a. Visually inspect each wrist seal for cracking, especially at the open edges of the seal (i.e., top and bottom edges).

b. Lay wrist seal on its side and press out flat. Hold seal at top and bottom edges and stretch vertically. Inspect for cracks and deterioration. Repeat this procedure until the entire circumference of the seal has been inspected. If cracks or deterioration are identified, discard seal.

c. Lay wrist seal on its side and press out flat. Hold seal at its sides (folded edges) and stretch horizontally. Inspect for cracks and deterioration. Repeat this procedure until the entire surface of the seal has been inspected. If cracks or deterioration are identified, discard seal.

d. Examine the stitching for security and the attachment of the adjustment straps to the seal. Discard seal if broken stitches are evident or if the adhesive on the wrist seal has deteriorated.

2. Inspect neck seal using procedures described in [steps a through d above](#)
3. Neck and wrist seals shall be used only after passing the above inspection.

5-39. Removal of CWU-79/P Neck/Wrist Seals.



Use care not to damage coverall fabric when removing neck and wrist seals. Use of a heat seal machine and/or application of toluene to the adhesive can aid in removal of old neck/wrist seals.

1. Turn neck/wrist seal area of coveralls inside out.

NOTE

Aquaseal was used in modification in accordance with ACC 613 and heat seal tape was used in contractor modification.

2. Apply toluene to aquaseal/adhesive or apply heat to heat seal tape/adhesive using heat machine to soften adhesive.

NOTE

When using toluene in the removal process, allow time for the aquaseal/adhesive to soften.

3. Lift/pull old neck/wrist seal away from cloth fabric.
4. Remove old aquaseal by dabbing with toluene and scraping excess off with a fid.
5. Carefully cut stitching holding old neck/wrist seal together and peel remainder of old neck/wrist seal from the neck of the coverall.
6. Clean the cloth side of the neck seal attachment area approximately 1 1/2 inches from the outside

edge using toluene solvent. Repeat until clean. Allow 20 minutes for toluene to dry.

5-40. Replacement CWU-79/P Neck Seal. To replace neck seal, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Adhesive, Polychloroprene (Not E2)	MIL-A-5540 NIIN 00-515-2246
1	Hand Roller	GGG-R-00620 NIIN 00-243-9401
1	CWU-79/P Neck Seal	3497AS105-1 NIIN 01-449-8918
1	Pencil, Grease	SS-P-196 NIIN 00-181-7267
As Required	Aquaseal, Neoprene Cement	Commercial (Not E2)
As Required	Toluene	TT-T-548 NIIN 00-281-2002 -or- NIIN 00-579-8431
As Required	Tape Seam, 1 1/2-Inch	NIIN 01-193-0469
As Required	Tape Seam, 7/8-Inch	NIIN 01-189-6361

- Notes: 1. Adhesives may come from supply that contain both a base adhesive and an accelerator. Mixing of the accelerator with the base adhesive is not recommended for use on any items requiring adhesive in this manual. Use only the base adhesive.
2. Aquaseal Neoprene Cement may be purchased from:
- McNett Corporation
Bellingham, WA
1-800-221-7325

1. Before installing replacement neck seal on the CWU-79/P, inspect each new seal in accordance with paragraph 5-38.

2. Remove neck seal in accordance with paragraph 5-39.

3. Mark a 1 1/4-inch adhesive application line parallel to the coverall neck opening and a 1-inch neck seal application line from the outside edge of the neck opening.

4. Apply double-sided tape to the top of the neck attachment. Fold the side seams of the neoprene neck seal together to find center front and back, mark on the inside (rubber) of the seal. Place/align the seal on the plastic ring, cloth side down, keeping 1/4 inch inside the ring edge so the alignment marks on the ring are visible. Align sides, front and back to the marks on the ring. Transfer all marks from the ring to the seal. Remove the seal and transfer marks to the cloth side. Reattach seal to the ring, rubber side down, and align, keeping 1/4 inch inside the ring edge.

5. Use the neck seal ring as backing under the coverall neck opening by placing it inside the opening with the inside (white) of the coverall neck opening facing up. Once in place, clamp down the material with binder clips so that the neck opening lays flat on the ring. On the cloth side of the seal, mark a 1-inch adhesive application line parallel to the seal edge, at 1/8 inch increments as identified in step 4. Apply polychloroprene adhesive in the areas marked on the coverall (to the 1 1/4-inch mark), and on the neck seal (to the 1-inch mark) including the edge of the seal. Apply three coats of adhesive, observing proper dry time/procedures between each coat. When dry, remove seal from the ring.

NOTE

Do not stretch seal while attaching or folds will form.

6. Align the seal to the coverall (cloth side of seal to inside of coverall) orienting front and back of each. At side marks, dampen the adhesive with a light coat of toluene. Follow seal attachment line while attaching seal to coverall (1 inch mark). As seal is being attached, fold/roll seal edge to coverall adhesive application line (1 1/4 inch mark) so that the seal presents a flat finish. Use roller if needed. Once in place, allow the adhesive to dry a minimum of 24 hours.

5-41. Replacement of CWU-79/P Wrist Seal.

Materials Required

Quantity	Description	Reference Number
As Required	Adhesive, Polychloroprene (Not 1)	MIL-A-5540 NIIN 00-515-2246
1	Hand Roller	GGG-R-00620 NIIN 00-243-9401
1	Wrist Seal	3497AS104-3 NIIN 01-449-8920
1	Pencil, Grease	SS-P-196 NIIN 00-181-7267
As Required	Aquaseal, Neoprene Cement	Commercial (Not 2)
As Required	Toluene	TT-T-548 NIIN 00-281-2002 -or- NIIN 00-579-8431
As Required	Tape Seam, 1 1/2-Inch	NIIN 01-193-0469
As Required	Tape Seam, 7/8-Inch	NIIN 01-189-6361

- Notes: 1. Adhesives may come from supply that contain both a base adhesive and an accelerator. Mixing of the accelerator with the base adhesive is not recommended for use on any items requiring adhesive in this manual. Use only the base adhesive.
2. Aquaseal Neoprene Cement may be purchased from:

McNett Corporation
Bellingham, WA
1-800-221-7325

NOTE

The following procedure requires the use of a minimum of two tubes three inches in diameter and 8 inches long. The tubes must be inserted into the sleeves of the coveralls to stabilize the sleeves and cuffs during installation of wrist seals.

1. Before installing replacement wrist seal on the CWU-79/P, inspect each new seal in accordance with paragraph 5-38.

2. Remove wrist seal in accordance with paragraph 5-39.

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3. Orient left and right wrist seal by the direction for the pile fastener tape location. The hook fastener tape strap should be closest to the seal opening end. The pile fastener tape will mate by pulling toward the body, up and around the wrist, to the back of the hand.

4. Turn wrist seal inside out, apply toluene approximately 1 1/2 inches from the outside edge, rubber side of wrist seal. (The end without the hook and pile fastener.) Let area dry and repeat.

5. Mark an adhesive application line on the wrist seal at 1 1/4 inches on the edge prepared in step 4.

6. Install 3-inch diameter tube into coverall sleeve edge on the green side of cloth.

7. Mark an adhesive application line 1 1/2 inches from the coverall sleeve edge on the green side seam.

8. Install the wrist seal over the tube overlapping the coverall sleeve approximately 1 1/4 inches from the coverall sleeve opening, with hook and pile fastener furthest away from sleeve opening. Line up coverall underarm sleeve seam with wrist seal seam.

9. Fold wrist seal back on itself at coverall sleeve end 1 1/2 inches.

10. Apply adhesive in the areas marked on the coverall sleeve. Apply three coats observing proper drying time/procedures between each coat.

NOTE

Dampen sleeve adhesive as required using light coat of toluene.

11. Before third coat of adhesive is dry, roll cuff over the adhesive on coverall sleeve to the 1 1/4 inch marks and turn down edge to the 1 1/2 inch marks.

12. Using roller or fid, apply pressure to the cuff and sleeve adhesive area and bond together.

13. Allow to dry for a minimum of 24 hours.

14. After dry, work tube out of coverall sleeve by rolling fabric off the tube.

15. Turn sleeve inside out and apply coat of aquaseal to wrist seal and coverall covering an area approximately 3/8 inch on either side of the seam

edge. Using an acid brush, smooth the aquaseal along the seam. If heat seal tape is applied over adhesive, it shall extend 1/2 inch over the edge of the cloth onto the neck/wrist seal area with remaining tape applied to the coverall fabric. Aquaseal or heat seal tape shall be acceptable.

16. Allow to dry a minimum of 24 hours.

17. Water test in accordance with paragraph 5-91.

5-42. HGU-32/P ANTI-EXPOSURE HOOD ASSEMBLY AND HAU-12/P ANTI-EXPOSURE MITTENS STORAGE. Refer to Sections 5-8 and 5-9 for procedures required to place the HGU-32/P hood and HAU-12/P mittens in service. To stow the hood and mittens in the CWU-79/P coverall proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Cord, Nylon, Type I (with core strands removed)	MIL-C-5040, NIIN 00-240-2154

1. Cut three 60-inch lengths of nylon cord.

2. Tie one cord to the grommet of each mitten and the hood using a 2-inch bowline knot.

3. Tie the other end of each cord to the grommet in the thigh pocket of the CWU-79/P coverall.

4. Fold hood and mittens to fit the thigh pocket. Accordion fold cords, secure with rubber band and stow in thigh pocket.

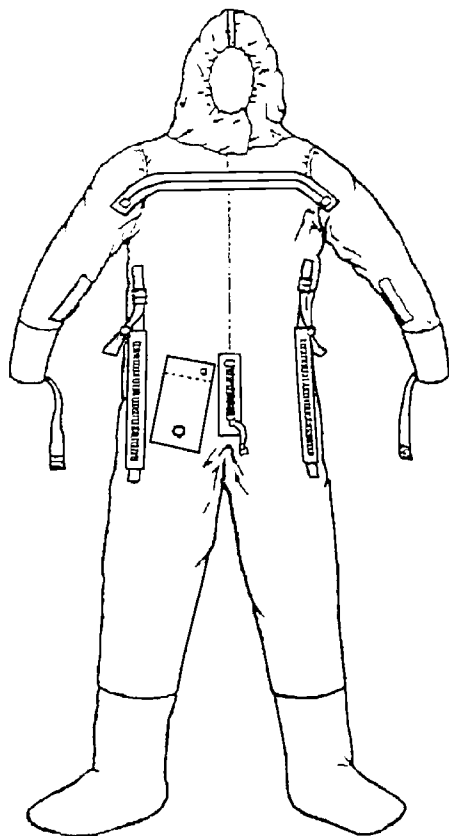
5-43. STORAGE.

5-44. Deleted.

5-45. Store ensemble in accordance with paragraph 5-96.

CAUTION

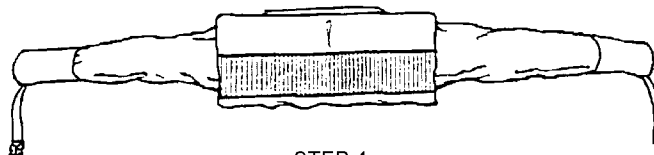
Do not store coveralls or spare parts in a lighted area (sunlight or fluorescent) or near power generators. Sunlight, fluorescent light, and generators produce ozone, which will degrade any rubber parts.



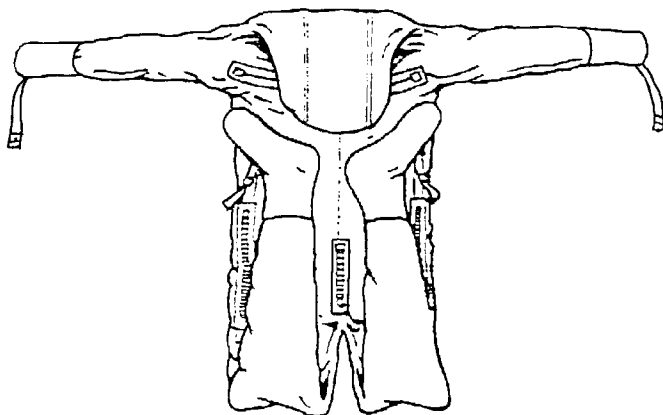
STEP 1



STEP 3
FOLD LEGS SECOND TIME



STEP 4
FOLD LEGS AND BODY OF COVERALL



STEP 2
FOLD LEGS FIRST TIME



STEP 5
TUCK SLEEVES BETWEEN
FOLDS 2 AND 3 OF COVERALL

Figure 5-4. Folding Procedure for CWU-79/P Anti-Exposure Coverall

Section 5-2A. CWU-83/P Passenger Anti-Exposure Coverall Ensemble

5-45A. GENERAL.

5-45B. The CWU-83/P Passenger Anti-Exposure Coverall Ensemble, which is comprised of the CWU-83/P Passenger Anti-Exposure Coverall (PAEC), neoprene gloves, neoprene hood, and worn with the LPU-32/P or LPP-1A life preserver unit and HGU-24/P cranial, is designed to provide cold weather/water protection for non-combat equipped passengers. The ensemble will be used on Carrier Onboard Delivery (COD) and Vertical Onboard Delivery (VOD) aircraft on flights over water or where cold climatic conditions could be hazardous or fatal should emergency egress be necessary. When worn over regular winter uniforms or winter civilian clothing, the CWU-83/P can provide 1 hour protection from hypothermia in 40°F seas.

5-45C. A limited number of no-cost initial outfitting quantities of the CWU-83/Ps (sizes small and large only) are available to the Fleet through the ISS warehouses via TYCOM direction. Once the initial outfitting quantities have been depleted, fleet activities can order the CWU-83/P through the supply system (table 5-1). All references to the ensemble shall be CWU-83/P series, Work Unit Code (WUC) 96K1100.

5-45D. CONFIGURATION.

5-45E. The CWU-83/P Passenger Anti-Exposure Coverall (PAEC) (figure 5-4A) was designed to meet requirements for anti-exposure protection for non-troop, non-aircrew personnel on Carrier Onboard Delivery (COD) and Vertical On-Board Delivery (VOD) missions when anti-exposure protection is required for the aircrew. The suit is a commercial coverall composed of a Nylon/Goretex™ laminate that prevents water from leaking in, but allows sweat vapor to

evaporate and alleviate heat stress and moisture build-up. The CWU-83/P has a neoprene hood stowed in the right thigh pocket and neoprene five-finger gloves stowed in each of the forearm pockets. The hood and each glove are secured to the suit with a snap-off ribbon lanyard. Three sizes of coverall are available to passengers and have color-coded labels on the chest area. The Size Small coverall has contrasting yellow trim; the Size Large has no contrasting color trim; the Size XXXLG has contrasting green trim. Neoprene wrist and neck seals stretch to fit each of the small, large and XXXLG size range. To expel trapped air in the suit, the suit is equipped with a self-burping exhaust valve on each shoulder, and air-blocking zip panels (gaiters) on each calf. To assist with search and rescue, a lifejacket retention loop is installed on the center front and a grab panel is installed across the center upper back.

5-45F. APPLICATION.

5-45G. The CWU-83/P shall be worn by non-combat equipped passengers for flight operations in accordance with the climatic and operational requirements established by the NATOPS General Flight and Operational Instructions Manual OPNAVINST 3710.7 Series.

5-45H. MODIFICATIONS.

5-45J. Currently there are no modifications for the CWU-83/P Ensemble.

5-45K. FITTING.

5-45L. The Ensemble should be issued to passengers using table 5-1A for guidance.

Table 5-1. CWU-83/P Ordering Information

Size	Part Number	NIIN	Color	Contrasting Trim Color
Small	3666AS100-1	01-517-7796	Orange	Yellow
Large	3666AS100-2	01-517-7801	Orange	None
XXXLG	3666AS100-3	01-517-7802	Orange	Green

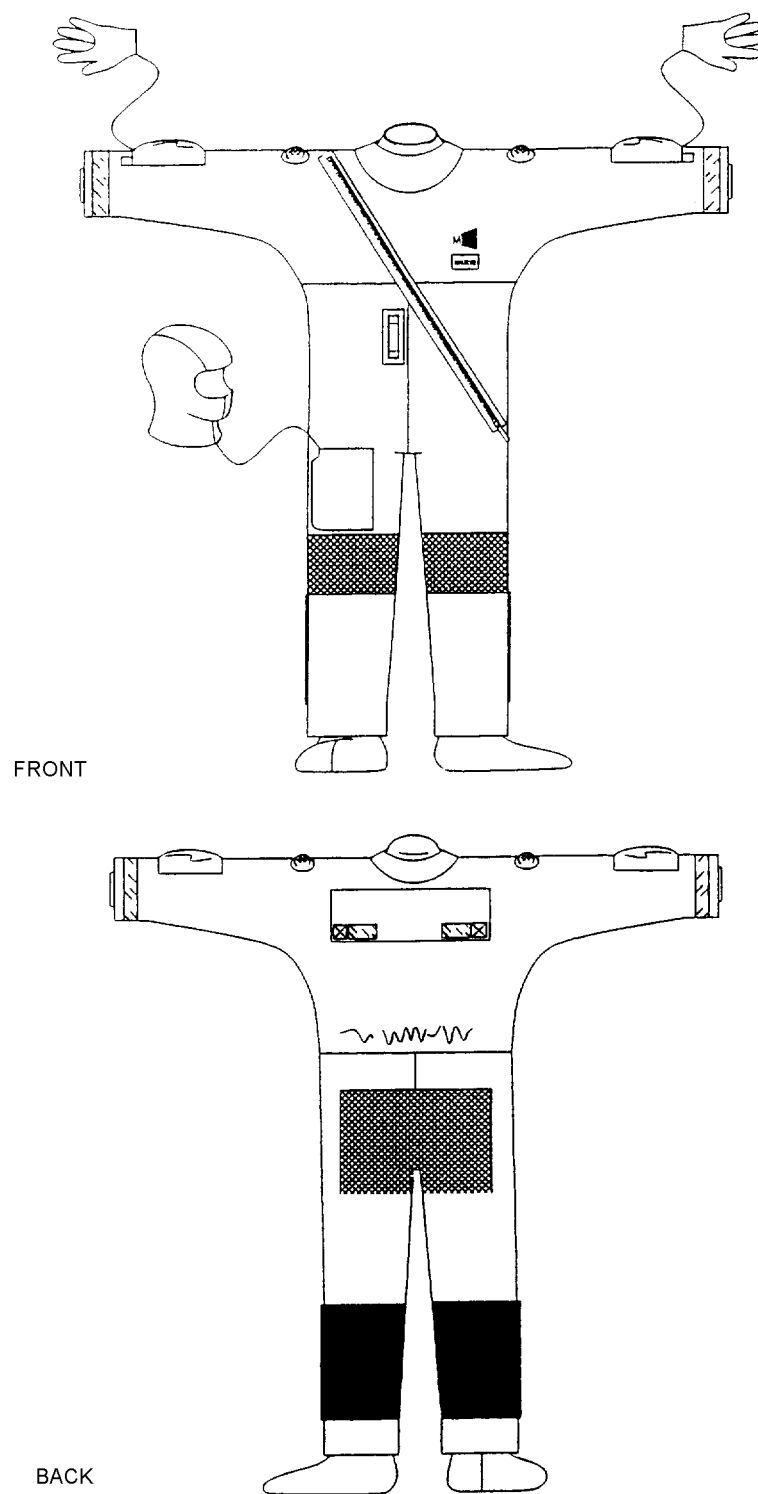


Figure 5-4A. CWU-83/P Passenger Anti-Exposure Ensemble

00504a

Table 5-1A. Sizing Guide (CWU-83/P Anti-Exposure Ensemble)

Size	Chest	Collar	Height
Small	32 - 42	11 - 14	5 ft - 5 ft 10 in
Large	44 - 54	14 - 17.5	5 ft 10 in - 6 ft 3 in
XXX Large	56 - 58	17 3/8 - 19	5 ft 5 in - 5 ft 9 in
Dimensions in inches, unless otherwise noted.			

5-45M. DONNING.**NOTE**

The CWU-83/P is sized to be worn over the passenger's winter clothing. The anti-exposure hood and mittens should remain stowed in the pockets and donned after egress unless passengers are otherwise advised by the crew chief.

1. Remove shoes/boots and sharp objects (jewelry, eyeglasses, and watches) (figure 5-4B). Sharp objects and jewelry shall be carried in the passenger's pocket to prevent damage to the coverall.

2. Tuck pant legs in socks.

3. Step into suit through large zipper.

4. Pull suit up to waist and push each arm through each sleeve.

5. Reach behind back and pull neck seal over head.

6. Zip closed, being sure that zipper is completely seated against zipper stop.

7. Zip calf panels closed.

8. Don life preserver.

9. Don cranial.

10. Put on shoes/boots. Watches and eyeglasses may be replaced after donning.

5-45N. DOFFING.

1. Remove life preserver, cranial, and if worn, hood and gloves.

2. Stow hood and gloves in appropriate pockets.
3. Open zipper.
4. Remove watch and eyeglasses, if worn.
5. Grasp chest area of coverall and pull up and back over head.
6. Pull wrist seals off hands.
7. Peel coverall down.
8. Step out of coverall.
9. If gaiters have turned inside out (i.e., are on the front side of the calf, turn right side out (i.e., are on the back side of the calf).

5-45P. MAINTENANCE.**NOTE**

Quality Assurance (QA) inspection requirements are included in inspection, repair, and replacement procedures. When a procedure is underlined, an authorized QA representative shall verify that the procedure was correctly accomplished before the next step can be performed.

5-45Q. Maintenance of the CWU-83/P consists of inspection, cleaning, repair, and replacement. Repair and replacement functions for the CWU-83/P shall be accomplished at organizational (O) and intermediate (I) level or above. All maintenance actions shall be documented in accordance with OPNAVINST 4790.2 Series. In addition, a damage chart (figure 5-4C) shall be maintained for each CWU-83/P coverall. The damage chart is intended as an aid to O-level maintenance technicians in describing needed repairs by I-level personnel. I-level technicians shall use the damage chart as an aid during inspection.

5-45R. INSPECTION. Inspection requirements of the CWU-83/P Passenger Anti-Exposure Coverall shall include Place-In-Service, Preflight, Postflight, and 360-Day inspections.

5-45S. Place-In-Service Inspection. The Place-In-Service inspection shall be performed prior to placing in service when issued and upon removal from storage. Inspection shall be performed in accordance with paragraph 5-45V, 360-Day inspection.

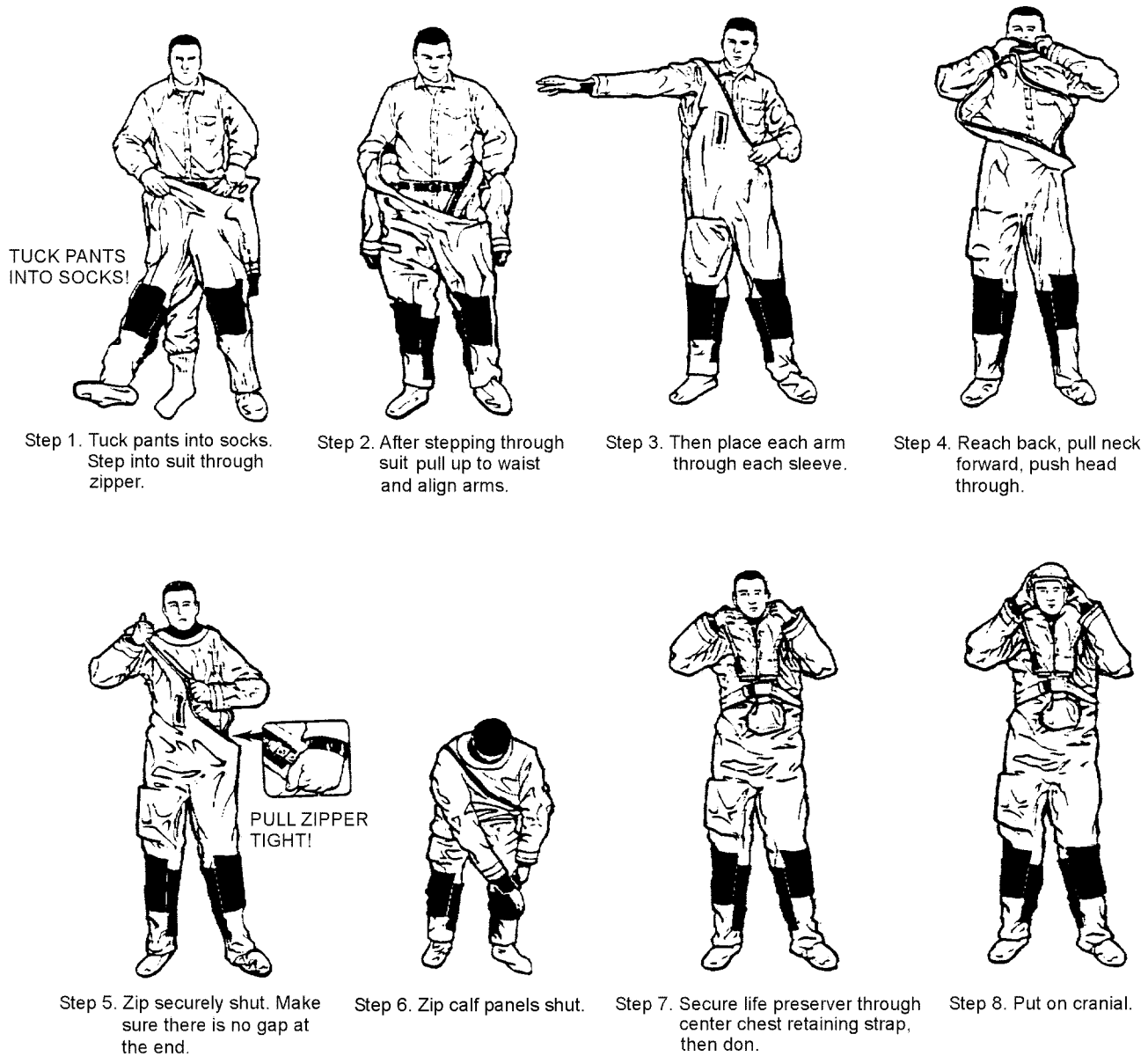


Figure 5-4B. Donning Steps for CWU-83/P Passenger Anti-Exposure Ensemble

005004b

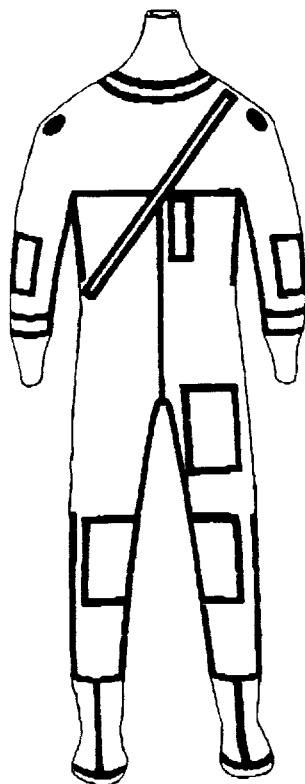
INSPECTING ACTIVITY _____ DATE _____
 INSPECTOR _____ COVERALL SERIAL # _____

INSPECTION/TEST REMARKS: _____

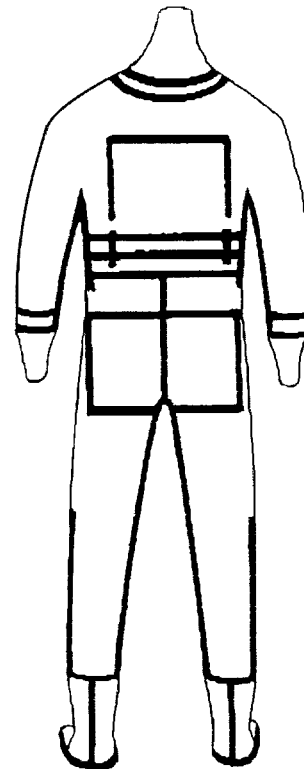
REPAIR REMARKS: _____

REPAIRED BY _____ INSPECTOR _____ DATE _____

(COVERALL DEPICTED INSIDE OUT)



FRONT



BACK

Figure 5-4C. CWU-83/P Anti-Exposure Coverall Damage Chart

00504c

NOTE

Although there is no requirement for anti-exposure suits to be inspected at certain times of the year, the best maintenance practice for the suit is to time the inspections of the anti-exposure suits so that the 360-Day Inspection is being done as the suit is taken out of seasonal storage in the fall. See paragraph 5-96 for storage requirements and storage clarification.

5-45T. Preflight Inspection. The preflight inspection is a visual inspection that shall be performed by an assigned aircrewmember who will inspect and issue a coverall assembly to each passenger prior to each flight as follows:

- 1. Zippers for proper function and ease of use.
- 2. Seams for loose tape or separation.
- 3. Fabric for tears, cuts, worn areas, and other deterioration resulting in leakage.
- 4. Neck and wrist seals for damage and proper bonding to coverall.
- 5. Socks for attachment to coverall.
- 6. Arm pockets for gloves. Right and left as appropriate.
- 7. Thigh pocket for hood.

5-45U. Postflight Inspection. Perform the Postflight inspection as follows:

- 1. Perform the preflight inspection in accordance with paragraph 5-45T.
- 2. After inspection, hang coverall on a hanger inside out.
- 3. Allow to air dry in a cool, dry, well ventilated area.

5-45V. 360-Day Inspection. The 360-Day inspection shall be performed prior to placing in service and every 360 days thereafter at intermediate level as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Lubricant Stick	Zipperease NIIN 00-999-7548

- 1. Remove suit from box and bag if applicable.
- 2. If required, clean fabric in accordance with paragraph 5-93.
- 3. Lay coverall right side out on clean flat surface or suspend from a hanger, and inspect as follows:
 - a. Inspect coverall surface, wrist seals, neck seal, and socks for damaged fabric, holes, and loose or broken stitching. Mark any defective areas on damage chart.
 - b. Inspect slide fasteners for damaged chain, loose teeth, improper chain alignment, damaged or split end seal blocks, damaged or missing pull tabs (metal and fabric), ease of operation, and loose slide fastener seam tape. Mark any defective areas on damage chart.
 - c. Turn coverall inside out, repeat steps a and b, and inspect seam tapes for peeling, wear, and fraying.
 - d. Using lubricant stick, apply coating of lubricant to slide fastener.
 - e. Repair in accordance with paragraph 5-97.

- 4. Leak test in accordance with paragraph 5-91.
- 5. Inspect neoprene hood and gloves for deterioration, cracking, seam separation or tears.
- 6. Document inspection and maintenance actions on damage chart (figure 5-3) and in accordance with OPNAVINST 4790.2 Series.

5-45W. SERVICE LIFE. The CWU-83/P coverall shall remain in service until it is beyond economical repair.

5-45X. CLEANING. Clean in accordance with [paragraph 5-93](#). When needed, use zippers and buttons in cold water with low sudsing detergent (NIIN 00-282-9699 or commercial equivalent) in delicate cycle.

NOTE

Do not bleach; do not dry-clean; do not iron; do not tumble dry.

5-45Y. STORAGE. Store ensemble in accordance with [paragraph 5-96](#).

CAUTION

Do not store coveralls or spare parts in a lighted area (sunlight or fluorescent) or near power generators. Sunlight, fluorescent light, and generators produce ozone, which will degrade any rubber parts.

5-45Z. REPAIRS, REPLACEMENT, AND FABRICATIONS. Repairs, replacements, and fabrications shall be performed at I-level maintenance. However, sewing wrist and neck seals, socks, reinforcement fabric, and gaiters to the CWU-83/P coveralls may be performed at O-level as long as seam sealing and leakage testing are performed at I-level. Repairs shall be made in accordance with [paragraphs 5-97](#) and [5-116](#).

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 5 to 7 stitches per inch with a minimum backstitch and/or over stitch of 1 inch.

5-45AA. Removal of Original Neck and Wrist Seals and Socks. Remove neck and wrist seals and socks from CWU-83/P ensemble as follows:

CAUTION

Use care not to damage coverall fabric when removing neck and wrist seals.

1. Turn coveralls inside out.
2. Apply heat to seam tape (to break adhesion bond).
3. Lift/pull old seam tape away from inner cloth.

WARNING

Do not use toluene near open flames, heat, or electrical sparks. Avoid prolonged contact with skin or breathing fumes. Use only in well ventilated area.

CAUTION

Toluene may damage equipment if not used with care. Avoid all contact with areas not to be cleaned. Wipe up excess or spills immediately.

4. Clean fabric by brushing lightly with toluene.

5-45AB. Removal of Replacement Neck and Wrist Seals and Socks.

1. Turn coveralls inside out.
2. Apply heat to seam tape to break adhesion bond.
3. Lift/pull seam tape away from inner cloth.

CAUTION

When removing stitching, be careful not to poke holes or slice body of coverall.

4. Remove stitching from seam using razor or seam ripper.
5. Cut off sleeve or leg extension (the fabric cuff that normally hangs over and covers the wrist seal or sock) along the seam line. Discard.

5-45AC. Cleaning of Replacement Neck and Wrist Seals. Replacement neoprene neck and wrist seals shall be obtained from TYCOM.

NOTE

Installed and replacement neck and wrist seals may exhibit a greenish powdery manufacturing residue and shall be cleaned prior to installation.

Materials Required

Quantity	Description	Reference Number
As Required	Acetone	ASTM-D-329 NIIN 01-003-0262
As Required	Paper Towels, White	A-A-696 NIIN 01-359-0798 or equivalent

Support Equipment Required

Quantity	Description	Reference Number
PR	Gloves, Rubber	DELTA-392 NIIN 01-463-5934
1	Safety Goggles	UVEX Splash Guard 9305 NIIN 01-292-2818 or equivalent
1	Respirator, NIOSH Organic Vapor Particulate Filter	808074 NIIN 01-312-8701 or equivalent

1. All installed and replacement neck and wrist seals shall be cleaned prior to installation or issue.



Use acetone in well ventilated area.

2. Dampen a paper towel with acetone and gently scrub the residue from the inside shiny surface of seal. Be careful not to use too much acetone. Shrinking and wrinkling of shiny neoprene skin indicates that too much acetone is being used. Be careful not to wet the adhesives, seam tapes or other fabric parts. Wetting these areas may result in parts becoming unglued and detached.

3. Wipe scrubbed area off using clean white paper towels until no more green film comes off on paper towel.

4. Dispose of all used paper towels in appropriate flammable waste container.

5. Let neck or wrist seals air dry prior to installation or use.

6. If using as replacement seal, install in accordance with paragraph 5-45AC1 or 5-45AD.

5-45AC1. Installation of Neck Seals. Inspect replacement seal for secure attachment to fabric carrier, damage, cracks, and deterioration. If damaged, discard.

Materials Required

Quantity	Description	Reference Number
As Required	Tape, Seam, 1 1/2-Inch or 7/8-Inch	NIIN 01-193-0469 NIIN 01-189-6361
As Required	Thread, Nylon, Size E	NIIN 00-244-0609
1	Roller, Hand	GGG-R-00620 or commercial
1	Pencil, Grease	SS-P-196 NIIN 00-181-7267
1	Neck Seal, Small	3666AS101-1
	-or-	
1	Neck Seal, Large	3666AS101-2



Do not use lead pencil or ball-point pen to mark coverall fabric; both will cause leakage.

1. Clean replacement neck seal in accordance with [paragraph 5-45AC](#).

2. Lay coverall flat, right side out and mark right and left shoulder front-to-back folds at neck edge. Next, fold coverall in half down length of body. Mark coverall at center front and center back folds at neck edge.

3. Fold right side out carrier in quarters; mark carrier at folds.

4. Turn carrier inside out. Overlap coverall at marks.

5. Sew carrier to neck edge with 3/8-inch seam allowance.

6. Heat seal with seam tape, pressing seam toward neck ensuring that tape overlaps seam allowance 1/4 inch each side of the seam allowance. Overlap ends of seam tape by 1 inch. Round seam tape edges to prevent peeling.

7. Leakage test in accordance with [paragraph 5-91](#).

5-45AD. Installation of Wrist Seals. Inspect replacement seal for secure attachment, damage, cracks, and deterioration to fabric carrier. If damaged, discard.

Materials Required		
Quantity	Description	Reference Number
As Required	Tape, Seam, 1 1/2-Inch or 7/8-Inch	NIIN 01-193-0469 NIIN 01-189-6361
As Required	Thread, Nylon, Size E	NIIN 00-244-0609
1	Roller, Hand	GGG-R-00620 or commercial
1	Pencil, Grease	SS-P-196 NIIN 00-181-7267
1 Pr	Wrist Seal, Small	3666AS102-1
1 Pr	Wrist Seal, Large	3666AS102-2



Do not use lead pencil or ball-point pen to mark coverall fabric; both will cause leakage.

1. Clean replacement wrist seals in accordance with [paragraph 5-45AC](#).

2. Fold sleeve in half, right side out, front to back. Mark in quarters at center front, center back, and the center of the left and right sides at folds.

3. Fold carrier in half, mark carrier in quarters at folds.

4. Turn carrier inside out. Match carrier marks to sleeve marks.

5. Sew carrier to wrist edge with 3/8 inch seam allowance.

6. Apply 1 inch heat seal tape over seam, pressing seam toward neck. Make sure you overlap seam 1/4 inch on either side of seam allowance. Overlap ends of seam tape by 1 inch. Round seam tape edges to prevent peeling.

7. Leakage test in accordance with [paragraph 5-91](#).

5-45AE. Installation of Socks.

Materials Required

Quantity	Description	Reference Number
As Required	Tape, Seam, 1 1/2-Inch or 7/8-Inch	NIIN 01-193-0469
As Required	Thread, Nylon, Size E	NIIN 00-244-0609
1	Roller, Hand	GGG-R-00620 or commercial
1	Pencil, Grease	SS-P-196 NIIN 00-181-7267
1	SRU-75/P Sock, Small Size 10	NIIN 01-315-9401
	Large Size 13	NIIN 01-311-0315

1. Install sock in accordance with [paragraph 5-105](#), steps 11 thru 19.

2. Leakage test in accordance with [paragraph 5-91](#).

5-45AF. Repair of Neoprene Seals, Hood and Mittens.

- 1. To repair holes, tears, and cracks, apply a small amount of neoprene adhesive (P/N 1041, NIIN 00-440-5603, (CAGE 31711) or MIL-A-5540 or MIL-A-1357) to the torn edges.
- 2. Allow 10-minutes for adhesive to become tacky. Butt edges together.
- 3. Surface cracking can be repaired by applying cement to affected areas.
- 4. Document in accordance with OPNAVINST 4790.2 Series.

5-45AG. Repair of Loose Seam Tape. Repair loose seam tape in accordance with paragraph 5-97 and 5-116.

5-45AH. Repair of Fabric Body. Repair fabric body in accordance with paragraph 5-97 and 5-116.

5-45AJ. Repair of Slide Fasteners. Repair slide fasteners in accordance with paragraph 5-100.

5-45AK. Replacement of Slide Fasteners. Replace slide fasteners in accordance with paragraph 5-101.

Table 5-1B. Slide Selection Table for CWU-83/P Anti-Exposure Ensemble

CWU-83/P Size	Entrance Slide Fastener Length	Part Number	NIIN
Small	34	1370AS501-4	01-323-8118
Large	34	1370AS501-4	01-323-8118
Note: Length excludes top and end stops.			

5-45AL. Replacement of Gaiters.

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Size E	NIIN 00-244-0609
1	Pencil, Grease	SS-P-196 NIIN 00-181-7267
As Required	Gaiter	3666AS103

- 1. Cut off old gaiter about 1 inch from original seam lines.
- 2. Sew new gaiter to remains of old gaiter with a 1/2 inch seam allowance, being careful to keep suit free. Unzip slide fastener if needed.
- 3. Sew again with a 1/4 inch seam allowance.
- 4. Document in accordance with OPNAVINST 4790 Series.

5-45AM. Repair of Reinforcement Fabric. Repair reinforcement fabric in accordance with paragraph 5-104.

5-45AN. Replacement of Relief Valve Diaphragm. Replace relief valve diaphragm as follows:

Materials Required

Quantity	Description	Reference Number
1	Diaphragm, Relief Valve	3666AS104

- 1. Open zipper and find the defective relief valve diaphragm.
- 2. Pull the diaphragm rubber away from the hole and cut the stem.



Do not damage the relief valve when removing the diaphragm.

- 3. Remove diaphragm by pulling it through the center hole on the outside of the relief valve using a pair of tweezers or needle nose pliers.



Do not damage the diaphragm when installing it through the center hole in the relief valve.

- 4. Install new diaphragm by inserting the replacement through the center hole on the outside of the relief valve and pull diaphragm stem through the inside center hole of the relief valve.
- 5. Pull on the diaphragm stem until the shoulder of the diaphragm is through and seats on the inside hole of the relief valve.

6. Cut excess diaphragm stem leaving approximately 3/16 inch of the diaphragm stem.

7. Install outside diaphragm by pushing the diaphragm through the center hole in the relief valve.

8. Document in accordance with OPNAVINST 4790 Series.

5-45AP. Repair Procedures For Defective Male/Female Glove Tether Line Retainer Snaps.

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 5 to 8 stitches per inch with a minimum over-stitch of 1/2 inch.

Defective female snaps shall be removed without replacement.

Materials Required

Quantity	Description	Reference Number
As Required	Tape, Fastener, Pile, 1 inch wide	MIL-F-21840 NIIN 00-151-6484 or equivalent
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884 or equivalent

1. Remove defective stud and eyelet from tether line end.

2. Let the fold remain in the tether line webbing.

3. Cut a 1 inch length of pile tape.

4. Center pile tape over the end of the tether line even at the folded edge.

5. Sew the pile tape to the tether line webbing using a boxstitch 1/16 inch from the edge of the webbing.

6. Stow the glove in the arm pocket and attach the pile tape to the hook tape at the hook tape corner opening where the hook tape ends meet.

7. Close the cover of the glove pocket and mate the hook and pile tape of the pocket to the sleeve.

8. If it is suspected that the integrity of the suit has been compromised by the damage to or the replacement of the tether line, the suit must be inspected and water leak tested in accordance with [paragraph 5-45V](#).

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Section 5-3. A/P22P-6 Series Anti-Exposure Apparel Assemblies, Constant Wear

5-46. GENERAL.

NOTE

Paragraphs in this section pertain to the A/P22P-6 series Anti-Exposure apparel assemblies. The A/P22P-6 series consist of the A/P22P-6(V)2, A/P22P-6A(V)2, A/P22P-6B(V)2, A/P22P-6C(V)2 and A/P22P-6D(V)2 assemblies, except where noted.

5-47. The A/P22P-6 series Anti-Exposure Apparel Assemblies, Constant Wear (figure 5-5) are continuous wear assemblies designed to keep the wearer dry. The complete assemblies provide protection from the thermal effects of cold water immersion in the event of emergency over water aircraft egress.

5-48. CONFIGURATION.

5-49. The A/P22P-6 series Anti-Exposure Apparel Assemblies, Constant Wear, consist of the Component listed in table 5-1C.

NOTE

Because of a one time severe shortage of CWU-62/P coveralls, the Air Force CWU-74/P Anti-Exposure suit was authorized for wear. The CWU-74/Ps currently in service are authorized for use. New CWU-74/Ps are not authorized to be ordered from supply.

The CWU-74/P shall be fit, maintained and repaired the same as the CWU-62/P Series Anti-Exposure Coverall.

5-50. UNDERCLOTHING. The combination of undergarments that shall be worn with the CWU-62/P series anti-exposure coverall depends on water temperature. See tables 5-1C and 5-2 for the recommended combinations. Refer to chapter 3 for detailed descriptions and sizing information for underwear.

5-51. ANTI-EXPOSURE COVERALL LINERS. See table 5-1C for the authorized liners that can be worn with the CWU-62/P series coveralls. Refer to chapter 3 for detailed descriptions and sizing and fitting information of the different authorized liners.

5-52. Deleted.

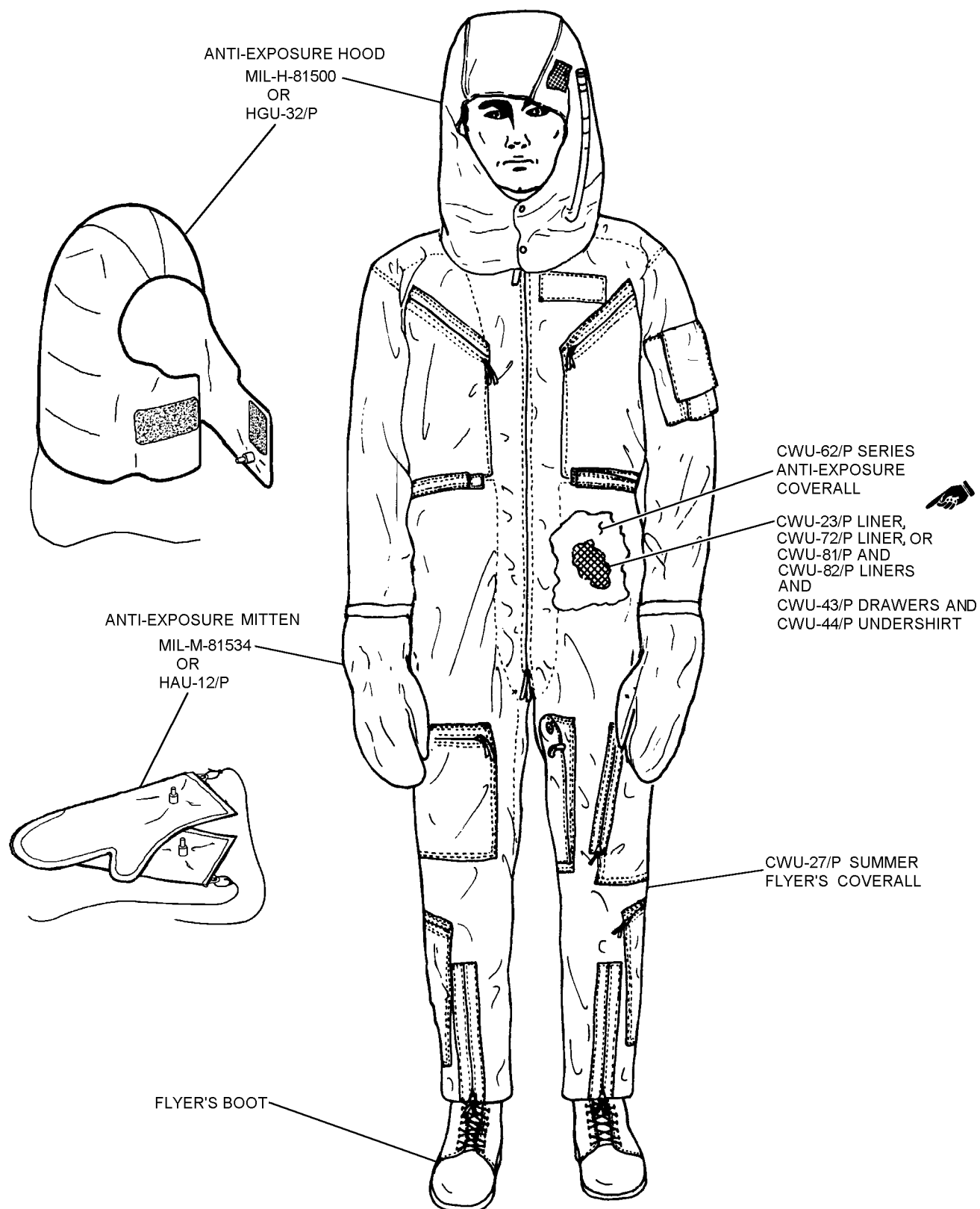


Figure 5-5. A/P22P-6 Series Anti-Exposure Apparel Assemblies, Constant Wear

**Table 5-1C. Components of A/P22P-6 Series Anti-Exposure
Apparel Assemblies, Constant Wear**

Component Nomenclature (Not [REDACTED])	Reference (paragraph)	Assemblies (A/P22P-)				
		6(V)2	6A(V)2	6B(V)2	6C(V)2	6D(V)2
CWU-43/P Drawers	5-50	X	X	X	X	X
CWU-44/P Undershirt	5-50	X	X	X	X	X
CWU-23/P Liner, Anti-Exposure	3-250A	X	O	O	O	O
CWU-72/P Liner, Anti-Exposure	3-250T	O	X	X	X	X
CWU-81/P Liner, Anti-Exposure (Shirt, women only)	3-250AK	X	X	X	X	X
CWU-82/P Liner, Anti-Exposure (Drawers, women only)	3-250AK	X	X	X	X	X
CWU-62/P Anti-Exposure Coverall	5-53	X	X	—	—	—
CWU-62A/P Anti-Exposure Coverall	5-53	—	—	X	—	—
CWU-62B/P Anti-Exposure Coverall	5-53	—	—	—	X	—
CWU-62C/P Anti-Exposure Coverall	5-53	—	—	—	—	X
CWU-74/P Anti-Exposure Coverall	5-53A	O	O	O	O	O
SRU-25/P Socks	5-54	X	X	—	—	—
CWU-75/P Anti-Exposure Socks	5-55	—	—	X	X	X
CWU-27/P Flyer's Summer Coverall or MEAFFS	5-56	X	X	X	X	X
Hood, MIL-H-81500	5-189	X	X	O	O	O
HGU-32/P Hood	3-224A	—	—	X	X	X
HAU-12/P Mittens	3-345A	—	—	X	X	X
<p>Legend: X - Required O - Optional — - Not Applicable</p> <p>Notes: 1. Multi Climate Protection System (MCPS) garments are authorized as replacements for some of the items above. See MCPS section of Chapter 3 for guidance.</p>						

Table 5-2. Recommended Underclothing Based on Water Temperature

Water Temperature	Recommended Underclothing
Above 60°F	CWU-43/P and CWU-44/P Aramid (Nomex) Cold Weather Underwear, Cotton Socks
50 to 60°F	CWU-43/P and CWU-44/P Aramid (Nomex) Cold Weather Underwear, CWU-23/P Liner or CWU-72/P Liner, Wool Socks
Below 50°F	CWU-43/P and CWU-44/P Aramid (Nomex) Cold Weather Underwear (two sets), CWU-23/P Liner or CWU-72/P Liner, Heavy Wool Socks
Note: For proper anti-exposure protection, a CWU-62/P Series Anti-Exposure Coverall must be worn over the recommended underclothing.	

5-52A. Deleted.

5-53. CWU-62/P SERIES COVERALL. The CWU-62/P Anti-Exposure Coverall (figure 5-8), CWU-62A/P Anti-Exposure Coverall (figure 5-9) and CWU-62B/P Anti-Exposure Coverall (figure 5-10) are one-piece garments supplied in 12 sizes (table 5-5). The CWU-62C/P Anti-Exposure Coverall (figure 5-10A) is a one-piece garment supplied in 9 sizes (table 5-5A). These coveralls shall not be worn in direct contact with the skin. The function of the anti-exposure coverall is most effective when worn over recommended undergarments. Skin irritation is known to result from wearing the coverall in direct contact with the skin. It is a lightweight coverall that prevents water from entering, but permits bodily produced moisture vapor to pass out, thus minimizing heat and moisture buildup. Proper maintenance is essential to the service life and safety of this coverall, as well as proper sizing and fitting. The CWU-62/P neck seal and wrist seals are manufactured from natural rubber, flocked on both sides. The CWU-62A/P, CWU-62B/P, and CWU-62C/P neck and wrist seals are manufactured from latex rubber. CWU-62A/P, CWU-62B/P, and CWU-62C/P wrist seals are procured separately from their respective coverall and are sized to the individual aircrewmember. SRU-25/P socks and CWU-75/P anti-exposure socks are procured separately. Either socks may be installed on any anti-exposure coverall. The entrance opening across the chest and the relief portal are sealed with water- and pressure-sealing slide fasteners.

5-53A. CWU-74/P COVERALL. The CWU-74/P Anti-Exposure Coverall is sized the same as CWU-62/P Series Anti-Exposure Coverall. CWU-74/P Anti-Exposure Coveralls will be issued on a limited

basis until such time as assets of CWU-62/P Series are available through supply. CWU-74/P Anti-Exposure Coverall shall remain in the custody of the individual to whom it was issued and remain in service until beyond economical repair. The coverall has two breast pockets, a right thigh pocket, a lower right and left pocket, and pencil pocket on the left upper sleeve. The relief slide fastener is eight inches long and installed horizontally on the coverall. The coverall comes with neck and wrist seals installed and can be placed in service using the installed seals. Replacement neck and wrist seals shall be the same as for the CWU-62/P Series. Anti-exposure socks shall be CWU-75/P and must be procured separately.

5-54. SRU-25/P SOCKS. SRU-25/P Socks are supplied in eight sizes (table 5-6). The socks are one-piece and are molded to shape to provide comfort and a good fit. Tops of socks extend above flight boots to reduce bulk and restriction.

NOTE

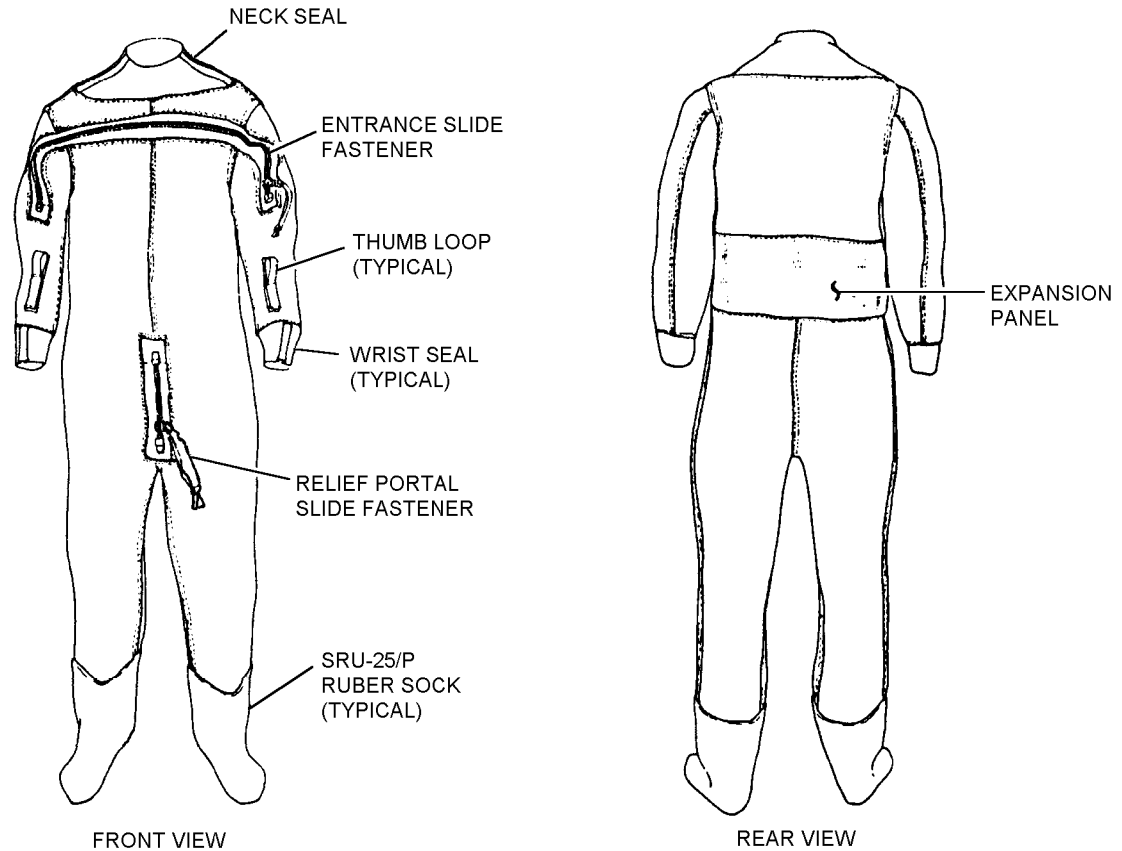
To determine proper size, see paragraph 5-69.

5-55. CWU-75/P ANTI-EXPOSURE SOCKS. The CWU-75/P Anti-Exposure Socks are supplied in 13 sizes (table 5-7). The anti-exposure socks are of sewn construction made of waterproof, breathable, stretchable fabric. Tops of socks extend above flight boots to reduce bulk and restriction.

Figures 5-6, 5-7, and 5-7A Deleted.

Tables 5-3, 5-4, 5-4A and 5-4B Deleted.

Pages 5-17 thru 5-20 Deleted.



005008

Figure 5-8. CWU-62/P Anti-Exposure Coverall

Table 5-5. Sizing Guide (CWU-62/P, CWU-62A/P and CWU-62B/P Anti-Exposure Coverall)

Height (inches)	Weight (pounds)	Chest Circumference	CWU-62/P and -62A/P NIIN	CWU-62B/P NIIN	Size
63-66	125-149	32-36	01-179-9992	01-388-0928	1 - (Small Short)
66-69	125-149	32-36	01-174-2047	01-388-0976	2 - (Small Regular)
69-72	125-149	32-36	01-176-9158	01-388-0920	3 - (Small Long)
65-67	150-174	37-40	01-176-9159	01-388-0934	4 - (Medium Short)
67-70	150-174	37-40	01-176-9160	01-388-0971	5 - (Medium Regular)
70-73	150-174	41-44	01-176-9161	01-388-0962	6 - (Medium Long)
66-69	175-199	41-44	01-176-9162	01-388-0963	7 - (Large Short)
69-72	175-199	41-44	01-176-9163	01-388-0969	8 - (Large Regular)
72-75	175-199	45-47	01-176-9164	01-388-0937	9 - (Large Long)
67-70	200-224	45-47	01-176-9165	01-388-0966	10 - (Extra Large Short)
70-73	200-224	45-47	01-176-9166	01-388-0924	11 - (Extra Large Regular)
73-76	200-224	45-47	01-176-9167	01-388-0922	12 - (Extra Large Long)

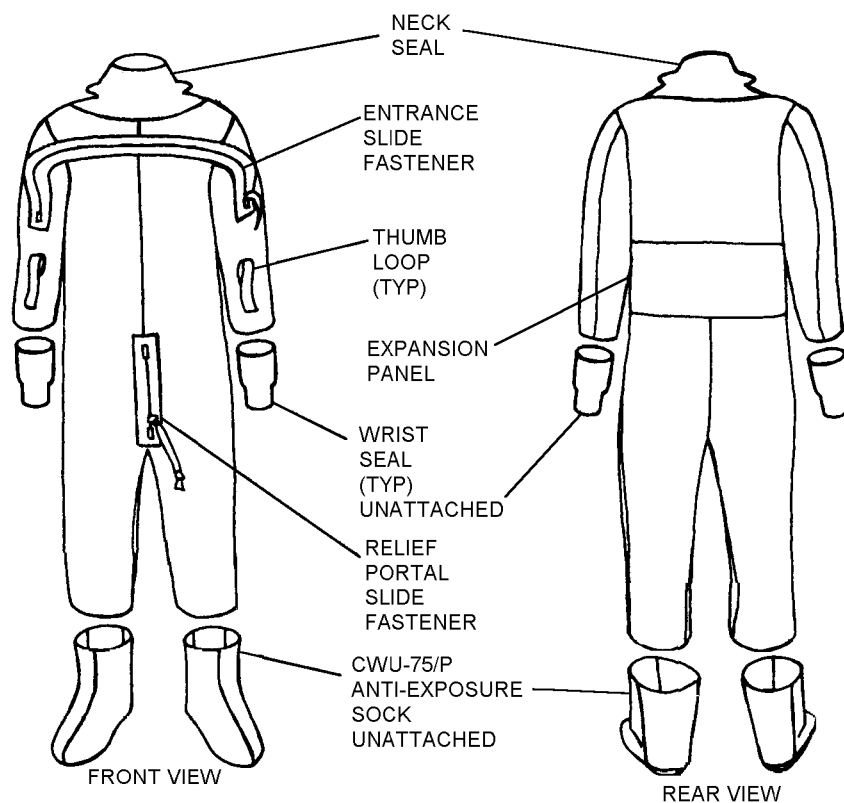


Figure 5-9. CWU-62A/P Anti-Exposure Coverall

5-9

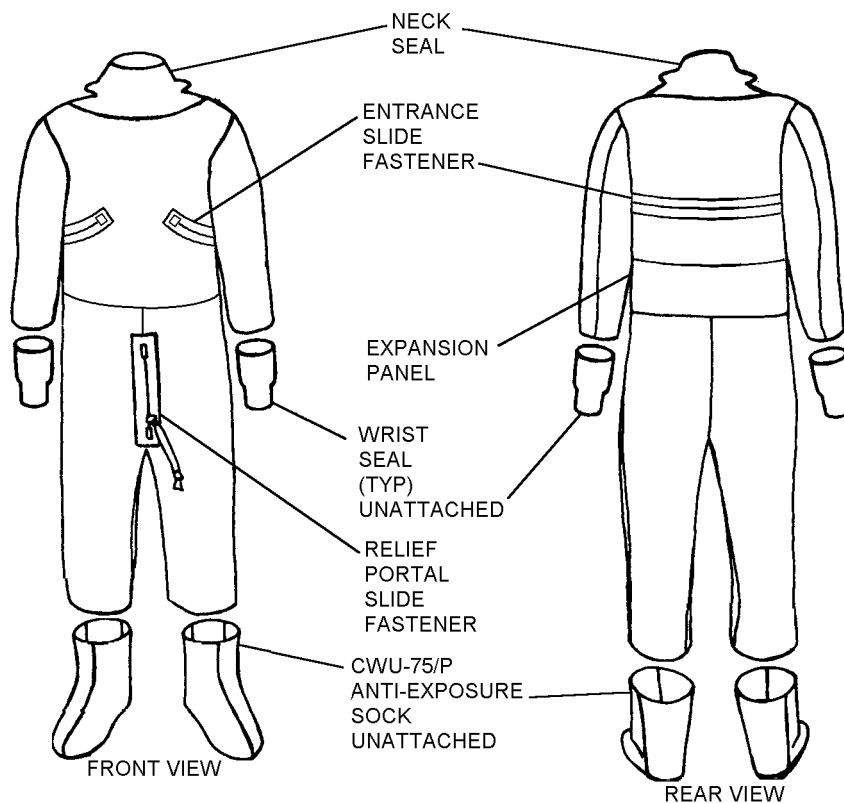


Figure 5-10. CWU-62B/P Anti-Exposure Coverall

5-10

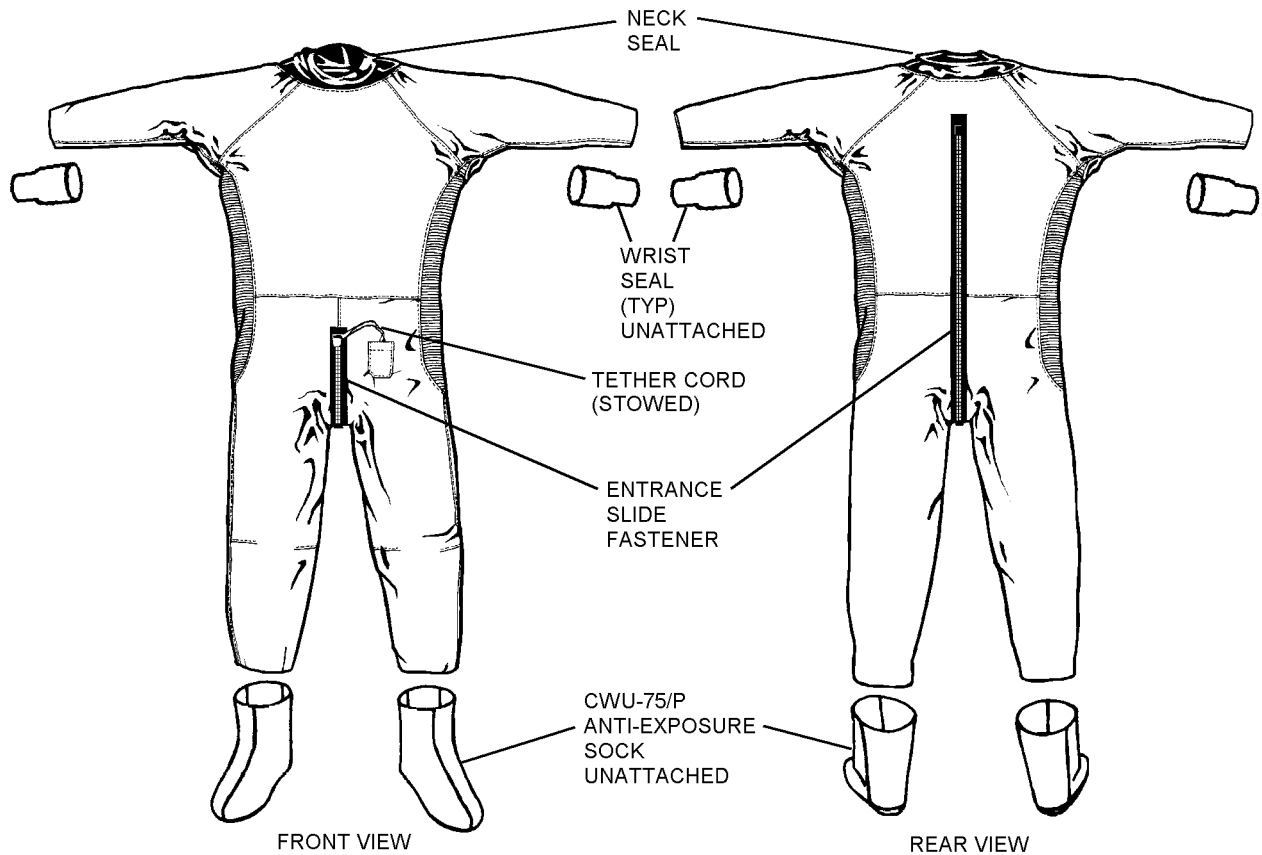


Figure 5-10A. CWU-62C/P Anti-Exposure Coverall

5-10a

Table 5-5A. Sizing Guide (CWU-62C/P Anti-Exposure Coverall)

Height (inches)	Hip Size (inches)	NIIN	Size
less than 64.5	less than 36	01-483-8563	Small/Short
64.5 - 67.5	less than 36	01-483-8564	Small/Regular
more than 67.5	less than 36	01-483-8565	Small/Long
less than 64.5	36 - 40	01-483-8567	Medium/Short
64.5 - 67.5	36 - 40	01-483-8585	Medium/Regular
more than 67.5	36 - 40	01-483-8572	Medium/Long
less than 64.5	more than 40	01-483-8573	Large/Short
64.5 - 67.5	more than 40	01-483-8574	Large/Regular
more than 67.5	more than 40	01-483-8577	Large/Long

Table 5-6. Sizing Guide (SRU-25/P Rubber Socks)

Narrow	NIIN	Regular	NIIN
5 1/2 N(B)	00-435-9652	6 R(D)	00-435-9656
7 1/2 N(B)	00-435-9653	8 R(D)	00-435-9657
9 1/2 N(B)	00-435-9654	10 R(D)	00-435-9658
11 1/2 N(B)	00-435-9655	12 R(D)	00-435-9659

NOTE

To determine the proper size, see paragraph 5-69.

5-56. MEAFFS OR CWU-27/P FLYER'S SUMMER COVERALL. The CWU-27/P coverall is a one-piece, unlined garment fabricated from aramid cloth. The coverall is used with standard personal equipment and shall be worn over the CWU-62/P series anti-exposure coverall. The flyer's summer coverall is fitted to the aircrewmember and normally corresponds to regular suit size. For sizes and dimensions, refer to chapter 3.

5-57. SUPPLEMENTARY EQUIPMENT.

5-58. HOOD ASSEMBLY, ANTI-EXPOSURE. Refer to Section 5-7 for the MIL-H-81500 hood and Section 3-17A for the HGU-32/P hood.

5-59. MITTENS, ANTI-EXPOSURE. Refer to Section 3-27A for the HAU-12/P mittens.

5-60. APPLICATION.

5-61. The A/P22P-6 Series Anti-Exposure Apparel Assemblies shall be worn by aircrewmembers for flight operations in accordance with the climatic and operational requirements established by the NATOPS General Flight and Operational Instructions Manual OPNAVINST 3710.7 (Series).

5-62. FUNCTION.

5-63. NORMAL. The A/P22P-6 Series Anti-Exposure Apparel Assemblies are intended to provide the aircrewmember with a lightweight coverall assembly that allows performance of all required flight operations without restricting body movements. The coveralls are moisture/vapor permeable to prevent excessive buildup of body heat.

5-64. EMERGENCY. In the event of immersion in water the CWU-62/P series coverall fabric will not permit entry of water, keeping the wearer dry. All components of the assembly (table 5-1C) must be worn to achieve the greatest level of exposure protection.

5-65. MODIFICATIONS.

5-66. The only modifications to the A/P22P-6 Series Anti-Exposure Apparel Assemblies authorized at this time are increasing leg or arm length of the CWU-62/P series coverall if required. Refer to paragraphs 5-113 and 5-114. See table 5-7A for applicable directives.

5-67. SIZING.

5-68. The A/P22P-6 Series Anti-Exposure Apparel Assemblies shall be properly sized to the aircrewmember based on the height, weight, and chest measurements shown in table 5-5. Determine the chest circumference for the CWU-62/P series coverall by first donning one CWU-44/P Cold Weather Undershirt. Determine chest circumference for the CWU-62/P and CWU-62A/P by taking a tape measurement at nipple height with the aircrewmember wearing one CWU-44/P cold weather undershirt and a liner (CWU-23/P, CWU-72/P, or CWU-81/P as applicable) or two CWU-44/P cold weather undershirts.

5-69. The size of SRU-25/P socks (table 5-6) and CWU-75/P Anti-Exposure socks (table 5-7) shall be governed by the size of the flight boot to be used. For the SRU-25/P, usually a sock one size smaller than the boot to be used will provide an acceptable fit (for example, size 8 socks for size 9 boots). For the CWU-75/P, a sock the same size as the boot will be required. To determine the size socks and boots required, the aircrewmember should don a pair of heavy wool socks, then don a pair of SRU-25/P socks or CWU-75/P Anti-Exposure socks corresponding to normal boot size. The socks (SRU-25/P or CWU-75/P) should be in a slightly stretched condition to prevent wrinkles or bulk in the boot but should not be fitted too tightly. Verify that the fit of the SRU-25/P or CWU-75/P socks is correct and comfortable. The aircrewmember should then don a boot and assure that the fit is comfortable. If smaller or larger SRU-25/P or CWU-75/P socks and/or boots are required, refit as necessary.

**Table 5-7. Sizing Guide
(CWU-75/P Anti-Exposure Socks)**

NIIN	Size
01-412-0949	3
01-316-6041	4R
01-317-7802	5R
01-315-9400	6R
01-316-1887	7R
01-316-1888	8R
01-316-1889	9R
01-315-9401	10R
01-315-9402	11R
01-315-9403	12R
01-311-0315	13R
01-412-0948	14
01-412-0951	15

5-70. FITTING.

5-71. FITTING THE CWU-62/P SERIES COVER-

ALL. Neck seals (for CWU-62/P Series coverall) and wrist seals (for CWU-62/P only) may be trimmed at the initial fitting, but the seals tend to adjust to the wearer after a short period of time. If no excessive seal restriction exists, and seal fit is acceptable to the aircrewmember, the seals should be left as issued. Neck seals shall fit snugly and remain in direct contact with the neck through all normal head movements. Wrist seals shall fit tightly enough to prevent water entry, but not tight enough to restrict blood flow. If seal sizing is required, proceed as follows:



Do not mark coverall material with ball-point pen or lead pencil. Use only tailor's chalk or china marking pencil. Trim neck seals with extreme caution. A smooth trim line is essential. Excessive trimming could result in loose seals that leak and necessitate replacement. Avoid nicking seal fab-

ric, as this could result in tearing seal when donning and doffing, and also could result in skin irritation.

1. Neck Seal Trimming. To trim neck seals, proceed as follows:

a. Mark a line around circumference of neck opening. Trimming increments shall not exceed 1/4 inch at a time.

b. Carefully cut along this line with a sharp pair of scissors.

2. (CWU-62/P only) Flocked Wrist Seals Trimming. To trim flocked wrist seals, proceed as follows:

a. Mark a line around circumference of wrist opening. Trimming increments shall not exceed 1/8 inch at a time.

b. Carefully cut along this line with a sharp pair of scissors.

3. Latex Wrist Seals. There are two types of latex wrist seals.

a. The first type is listed in [table 5-10](#) and comes in various sizes. It is shaped such that trimming would have no effect on the fitting of the wrist seal. Trimming is therefore not authorized.

b. The second type of wrist seal is a trimmable wrist seal. The wrist seal has trim lines spaced approximately 3/16 inch apart around the top circumference of the seal. To trim the wrist seal, proceed as follows:

(1) Starting at the top trim line, carefully cut along line with a sharp pair of scissors.

(2) Check fit. If not correct, continue trimming down one line at a time until fit is correct.

4. After trimming seals, have aircrewmember don coverall to determine seal restriction and water-sealing characteristics. Make any adjustments in accordance with [steps 1 through 3](#).

5-72. Deleted.

5-72A. Deleted.

Table 5-7A. A/P22P-6 Directives

Description of Modification	Application	Modification Code
One-Time Inspection and Submission of Inventory Date of Manufacture Information	A/P22P-6 Series Anti-Exposure Apparel Assemblies	67-1008
Notes: 1. As of 1 June 2004, this TD is rescinded and does not need to be annotated on the history card of the CWU-62/Ps, nor does it need to be complied with.		

5-73. INITIAL FITTING OF SRU-25/P SOCKS AND CWU-75/P ANTI-EXPOSURE SOCKS. Select the correct size socks (table 5-6 or 5-7) using paragraph 5-69 as a guide. Attach to the coveralls as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Tape, Seam, 1 1/2-Inch	NIIN 01-193-0469
	-or-	
	Tape, Seam, 7/8-Inch	NIIN 01-189-6361
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-244-0609
1	Roller, Hand	GGG-R-00620 or commercial
1	Pencil, China Marking	SS-P-196
1	Chalk	SS-C-266



Do not mark coverall with ballpoint pen or lead pencil. Use only china marking pencil or chalk.

NOTE

Installation of either SRU-25/P socks or CWU-75/P anti-exposure socks to CWU-62/P Series coverall is authorized. Document all maintenance actions in accordance with OPNAVINST 4790.2 Series.

CWU-75/P socks will replace SRU-25/P socks by attrition.

Socks may be replaced individually and need not be replaced as a pair.

1. Have aircrewmember don the A/P22P-6 Series assembly (except hood, mittens, and CWU-27/P), the

appropriate PCU Series torso harness, if applicable, and proper size heavy wool socks.

2. Mark coverall legs and socks (L and R) on inside and front and back to ensure socks are matched to correct leg during installation.

3. Have aircrewmember sit in a straight-back chair with legs drawn back, heels directly below kneecaps and feet flat on floor.

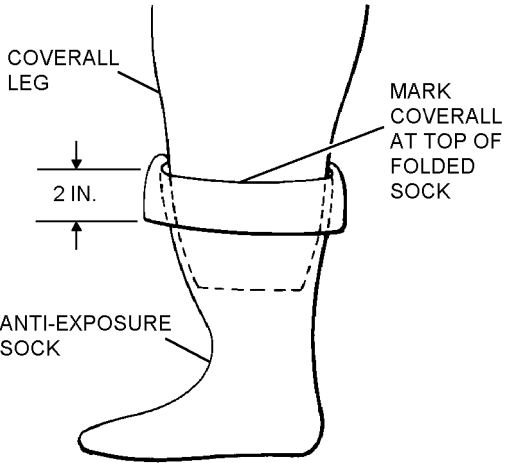
NOTE

If aircrewmember's leg length is such that allowance provided in steps 4 through 7 (2-inch sock fold and 1-inch allowance beyond inseam mark) are not possible, refer to paragraph 5-113 for coverall leg extending instructions.

Removing top 2 inches of sock at initial installation is intended to ensure adequate coverall leg material remains for future sock replacements.

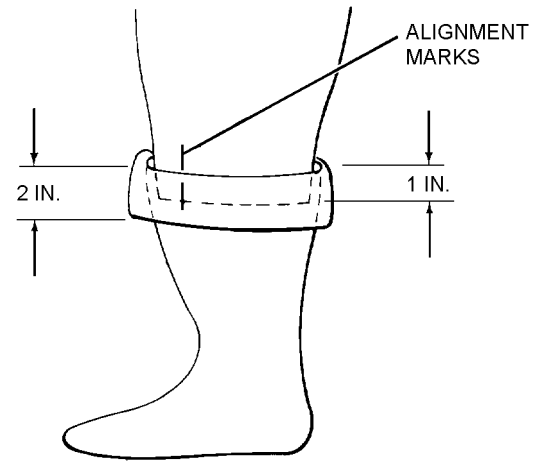
Ensure not to cut coverall too short.

4. Turn top 2 inches of sock down, forming a temporary cuff. Mark the circumference of coverall legs where they meet top of folded socks.



Step 4 - Para 5-73

5. Have aircrewmember doff socks and coveralls.
6. Remove top 2 inches of sock with a pair of sharp scissors.
7. Remove excess material from coverall leg by cutting a line 1 inch below the circumferential mark applied in step 4. Ensure leg is cut perpendicular to lengthwise direction of leg. Make alignment marks at front of coveralls leg and sock to ensure sock will be properly aligned with leg during attachment.



Step 7 - Para 5-73

5p73s7

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8. Turn coverall inside out.

NOTE

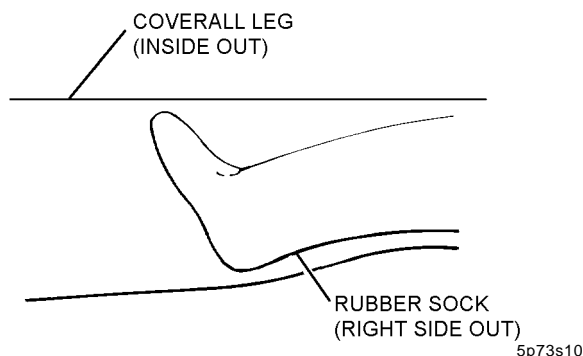
Due to slight differences in circumference of coverall leg and sock opening, it is recommended that alignment marks be added to both items before sewing. Make marks at front, back and both sides, equally spaced around circumference of both openings. It may be necessary to manually induce an uneven feeding of materials into sewing machine in order to compensate for differences in sock and coverall leg circumferences, thereby minimizing pleats or puckers.

9. Lay coverall out flat, face up.

NOTE

When attaching socks to coveralls, ensure right sock is on right coverall leg and left sock is on left coverall leg.

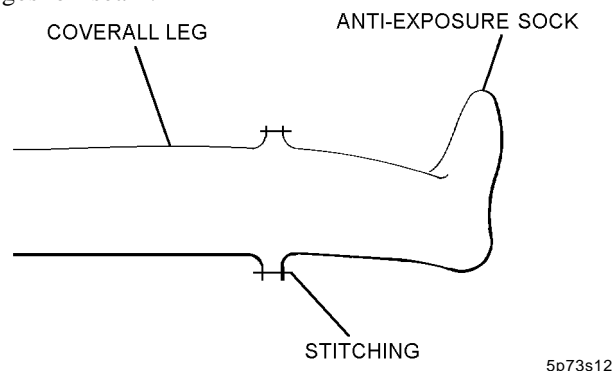
10. Insert sock into leg opening, so that right sides of sock and coverall leg are facing each other, and toe is pointing up (toward front).



Step 10 - Para 5-73

11. Beginning at front of leg, with leg and sock alignment marks matched, attach sock with one row of stitches, 1/4 inch from cut edges, 5 to 7 stitches per inch, using nylon size E thread. Overlap stitching 1/2 inch. Do not backstitch.

12. After removing suit from sewing machine, pull boot out through bottom of leg opening, exposing cut edges of seam.



Step 12 - Para 5-73

13. Fold cut edges of seam down over sock. Make fold as near stitch line as possible.

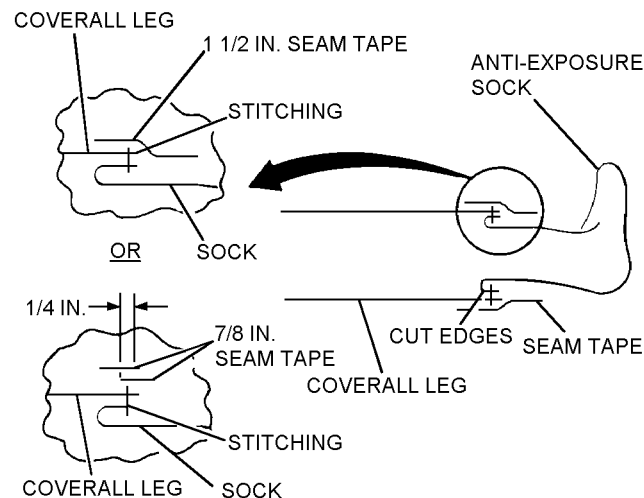
WARNING

Prior to application of seam tape, Aircrew Survival Equipmentman must be familiar with heat sealing machine operating procedures in NAVAIR 17-10DC-1. Refer to [paragraph 5-104](#) for application of seam tape. Do not allow any coverall material threads or sewing machine thread to protrude from under seam tape.

NOTE

Seam tape will be on the inside of coverall when finished.

14. Apply one layer of 1 1/2-inch seam tape to seam, keeping stitch line and cut edges as nearly centered under tape as possible. Overlap ends of seam tape 1 inch.



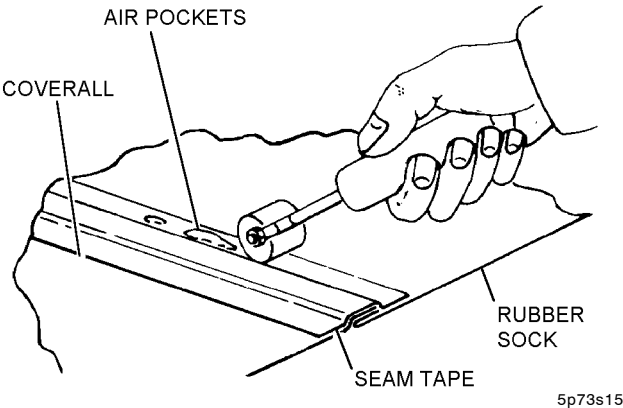
Step 14 - Para 5-73

NOTE

1 1/2-inch seam tape should be used when available.

If 7/8-inch seam tape is used, a second layer of seam tape may be applied, if necessary, to adequately cover stitching and cut edges of seam.

15. Immediately after lifting off heat sealer, smooth out any air pockets with a hand roller by rolling thoroughly along both sides of seam where air pocket occurs.



Step 15 - Para 5-73

16. Turn coverall right side out.

5-74. FITTING THE CWU-27/P SUMMER FLYER'S COVERALL. Select a CWU-27/P coverall one size larger than the size indicated in Chapter 3.

5-75. IDENTIFYING THE CWU-62/P SERIES COVERALL. After CWU-62/P series coverall has been fitted in accordance with paragraph 5-71 and the proper size socks have been attached, the coverall becomes the personal equipment of the aircrewmember and should be labeled as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Tape, Seam, 1 1/2-Inch	NIIN 01-193-0469
1	Sealer, Heat, Seam and Patch	MIL-S-85634
1	Roller, Hand	GGG-R-00620
1	Laundry Marking Ink	NIIN 00-161-4229
1	Stencil, Brush	NIIN 00-248-9285

1. Cut a label approximately 3 inches in length from seam tape and clearly print aircrewmember's name and organization on uncoated side of tape using indelible ink.

2. Position label on inside of coverall below caution label and heat seal. Refer to paragraph 5-104 for heat sealing procedure.

5-76. DONNING.

5-77. To don the A/P22P-6 Series assembly proceed as follows:

NOTE

The anti-exposure hood and mittens are not worn during flight but remain stowed in the CWU-27/P coverall or survival vest pocket for emergency use.

1. Don CWU-43/P drawers, CWU-44/P undershirt, CWU-23/P or CWU-72/P liner, and socks as recommended in table 5-2.



To avoid damage it is essential that talc be applied to the neck and wrist seals of the CWU-62A/P and CWU-62B/P, as well as to the neck, wrists and hands of the wearer prior to donning or doffing the coverall. Use care when donning or doffing. Suit fabric can be damaged. Remove watches, rings, and other sharp instruments which can puncture or abrade surfaces.

2. (CWU-62/P, CWU-62A/P or CWU-62B/P) Don the Anti-Exposure Coverall.

a. Don coverall by first inserting feet into anti-exposure socks while seated, and then pulling coverall up past waist.

b. Insert arms into sleeves.

c. Grasp upper part of coverall (CWU-62/P and CWU-62A/P behind head; CWU-62B/P in front of wearer) and pull neck seal over head. Adjust neck seal so that it is comfortable and seam tapes are aligned with shoulders.

e. Release thumb loops from hook and pile fastener tapes on sleeves. Place right loop over right thumb and extend right arm horizontally to side of body. Grasping entrance slide fastener tab with left hand, close fastener to a point past center of chest. Remove right thumb from loop. Place left thumb in left loop, horizontally extend left arm to side and, grasping slide fastener tab with right hand, completely close entrance slide fastener. Ensure pull tab is firmly seated into seal block and butted against end block. Remove thumb from thumb loop and mate fastener tapes on thumb loops with tapes on sleeves.

f. Close relief portal slide fastener. Ensure pull tab is firmly seated into seal block and butted against end block.

g. Burp the suit by manually venting excess air through the neck seal by squatting at the knees and bending forward.

3. (CWU-62C/P) Don the Anti-Exposure Coverall in accordance with procedures illustrated in [Figure 5-10B](#).

4. Don flyer's boots.

5-78. DOFFING.

5-79. (CWU-62/P, CWU-62A/P and CWU-62B/P) To doff the A/P22P-6 Series assembly, carefully reverse the donning procedures.



When doffing CWU-62/P series anti-exposure assembly, peel suit off inside out to ensure that neck seal and wrist seals are not damaged.

5-79A. (CWU-62C/P) To doff the A/P22P-6 Series assembly, carefully reverse the donning procedures. Doff the CWU-62C/P coverall in accordance with procedures illustrated in [figure 5-10C](#).

5-80. MAINTENANCE.

5-81. Repair and replacement functions for the CWU-62/P series coverall will be accomplished at the intermediate maintenance level or above.

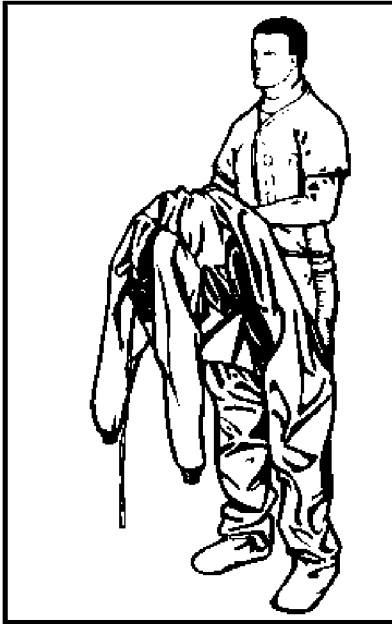
NOTE

Authorization is granted at organizational level to stitch wrist and neck seals and socks onto the CWU-62/P series coveralls, provided heat sealing and water tests are performed at the intermediate level.

Quality Assurance Representative (QA) points are included in inspection, repair, and replacement procedures. When a procedure is underlined, there is a QA requirement. After performing procedure, stop and have Quality Assurance Representative ensure that step has been performed correctly.

5-82. MAINTENANCE DOCUMENTS. Documents used to record history and maintenance information consist of those documents described in [chapter 2](#) of this manual and the CWU-62/P series coverall damage chart ([figure 5-11](#), [5-12](#), and [5-12A](#)). The damage chart is also intended to aid the organizational level custodians of the coverall in describing other needed repairs to the intermediate level technicians. It shall be used by the intermediate level personnel as an aid during inspections. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

5-83. SERVICE LIFE. Each component of the A/P22P-6 Series assembly shall remain in service until beyond economical authorized repair.



1) With coverall fully open, step into coverall so that the longest part of the slide fastener will be on your back. Pull coverall up to your knees.



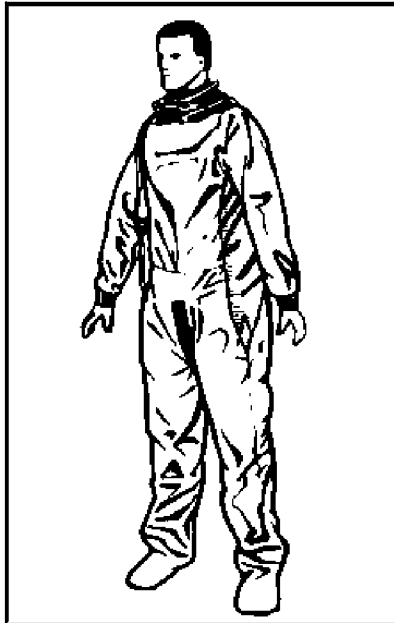
2) While squatting, bend forward and lift coverall over your head.



3) Put arms and head into coverall.



4) Once arms are in the sleeves and head is in the neck seal, begin to stand.



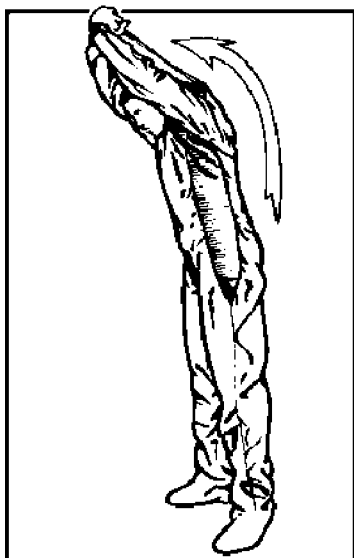
5) Allow head and hands to go through rubber seals. Once standing, adjust pant legs so that they are not twisted and slide fastener is running straight up the back.



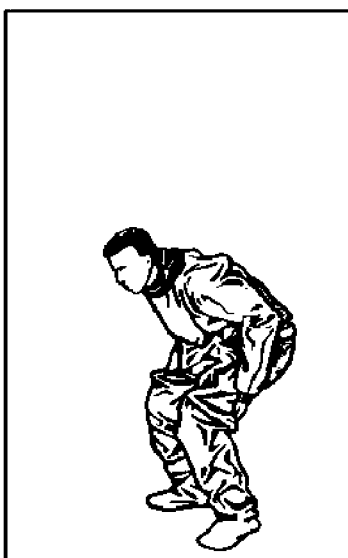
6) Close slide fastener by leaning forward (to provide tension), and pulling tether down back, through legs, and up the front. Make sure slide fastener is fully closed.

Figure 5-10B. Donning the CWU-62C/P Anti-Exposure Coverall

5-10b



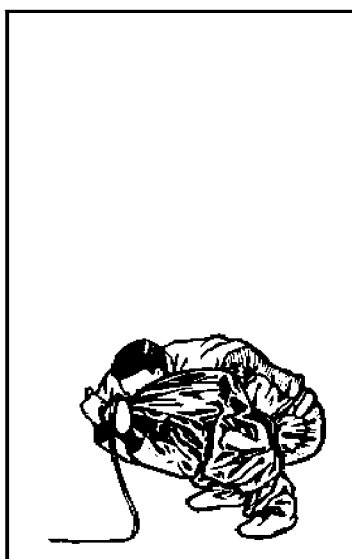
1) Pull tether cord down and through legs. Bring tether over your shoulder and pull straight up while slightly bending forward (for tension). Open slide fastener fully.



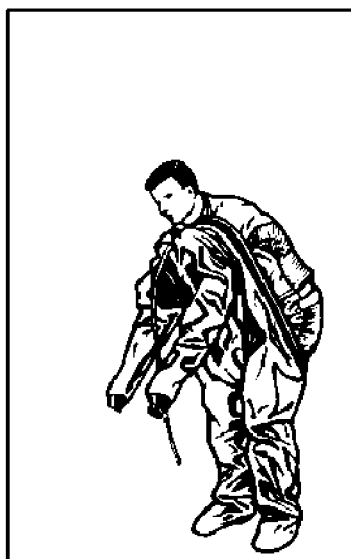
2) While beginning to squat, bring coverall over buttocks until coverall is behind your knees.



3) Reach over your shoulders and pull fabric over head and around shoulders. DO NOT PULL NECK SEAL.



4) Pull coverall until your head slides out of the neck seal and coverall is over your shoulders.



5) Begin to stand and remove your arms from coverall.



6) Stand and take coverall off by removing booties and pulling coverall off your legs.

Figure 5-10C. Doffing the CWU-62C/P Anti-Exposure Coverall

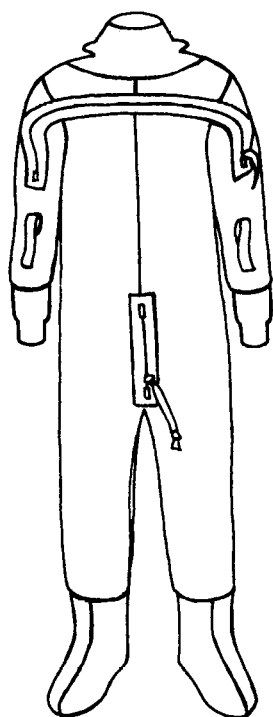
5-10c

(ORGANIZATIONAL USE) _____ DATE _____
ACTIVITY/SQN. _____ COVERALL SERIAL NO. _____ C.D.I. _____
REMARKS: _____

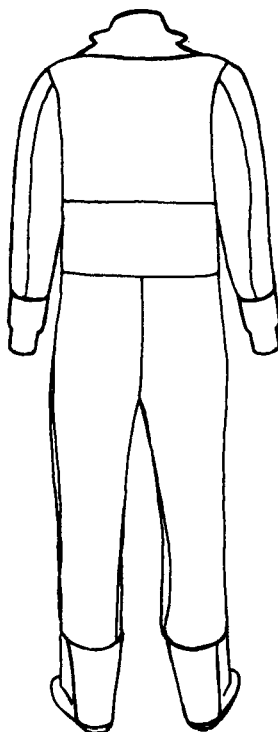
(INTERMEDIATE USE)
INSPECTION/TEST REMARKS: _____

REPAIR REMARKS: _____

REPAIRED BY _____ INSPECTOR _____ DATE _____



FRONT VIEW



REAR VIEW

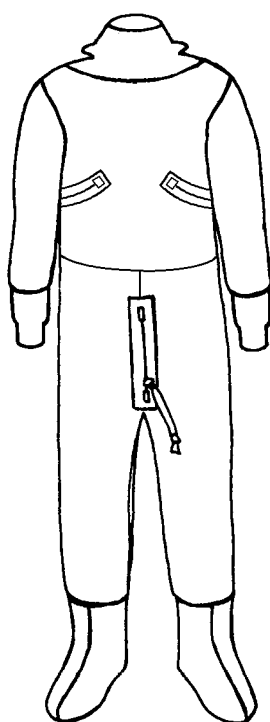
Figure 5-11. CWU-62/P or CWU-62A/P Anti-Exposure Coverall, Damage Chart

(ORGANIZATIONAL USE) _____ DATE _____
 ACTIVITY/SQN. _____ COVERALL SERIAL NO. _____ C.D.I. _____
 REMARKS: _____

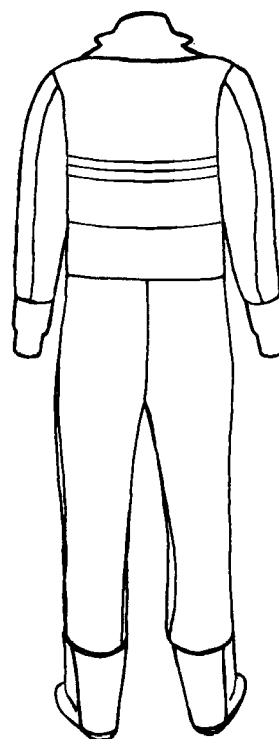
(INTERMEDIATE USE)
 INSPECTION/TEST REMARKS: _____

REPAIR REMARKS: _____

REPAIRED BY _____ INSPECTOR _____ DATE _____



FRONT VIEW



REAR VIEW

Figure 5-12. CWU-62B/P Anti-Exposure Coverall, Damage Chart

NAVAIR 13-1-6.7-2

(ORGANIZATIONAL USE) _____ DATE _____
ACTIVITY/SQN. _____ COVERALL SERIAL NO. _____ C.D.I. _____
REMARKS: _____

(INTERMEDIATE USE)
INSPECTION/TEST REMARKS: _____

REPAIR REMARKS: _____

REPAIRED BY _____ INSPECTOR _____ DATE _____

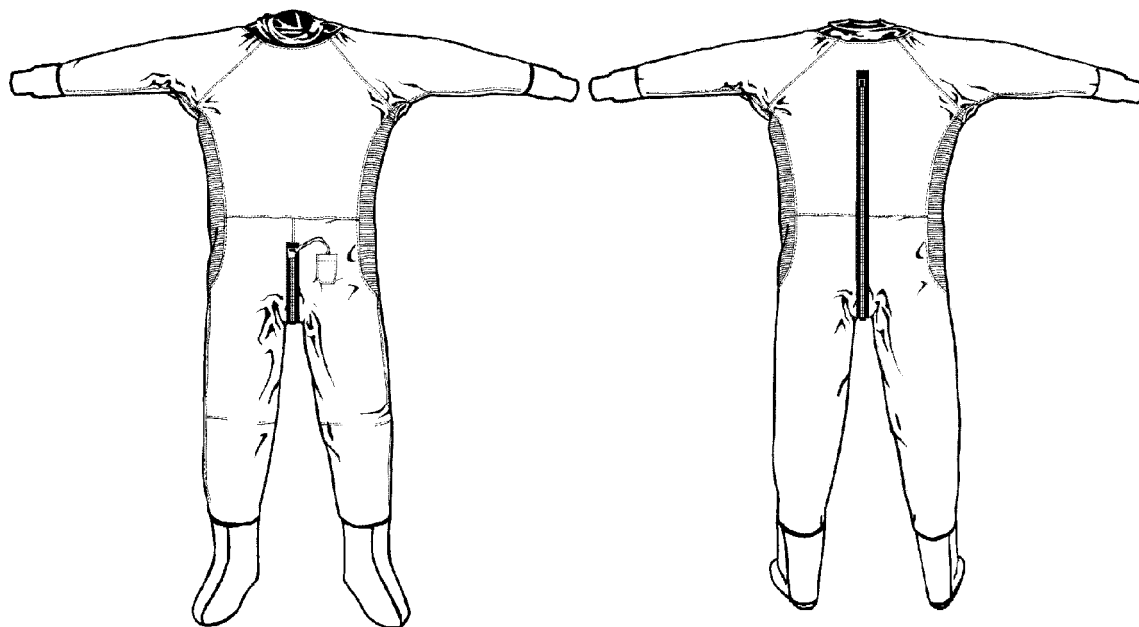


Figure 5-12A. CWU-62C/P Anti-Exposure Coverall, Damage Chart

5-12a

5-84. PREFLIGHT INSPECTION. The Preflight Inspection shall be performed on the CWU-62/P series coverall by the aircrewmember to whom the coverall is issued prior to each flight. To perform the inspection, inspect the following:

1. Slide fasteners for proper functioning.
2. Seams for loose tape, separation, cuts and tears.
3. Neck and wrist seals for damage and proper bonding to the coverall.
4. Socks for proper attachment to coverall.
5. Assembly for cuts, tears, abrasions and deterioration.
6. If any discrepancies are noted, return coverall to Aircrew Survival Equipment Shop for further inspection.

5-85. POSTFLIGHT INSPECTION. To perform the Postflight Inspection, perform a Preflight Inspection (paragraph 5-84), and proceed as follows:

1. Hang coverall on a wooden hanger, inside out.
2. Allow coverall to air dry in a cool, dry, well ventilated area.

5-86. CWU-62/P AND CWU-62A/P PRE-INITIAL ISSUE INSPECTION.

1. Upon receipt from supply, all CWU-62/P and CWU-62A/P series coveralls shall be water tested in accordance with paragraph 5-91.
2. If excessive leakage is found, the CD/QAR shall determine if repairs shall be completed or the garment shall be considered beyond economical repair.

5-87. PLACE-IN-SERVICE INSPECTION/PROCEDURES. Prior to placing the CWU-62/P series coverall in service, both when issued and when removed from long-term storage, proceed as follows:

NOTE

Although there is no requirement for anti-exposure suits to be inspected at certain

times of the year, the best maintenance practices for the suits are to time the inspections of the anti-exposure suits so that the 360-Day Inspection is being done as the suit is taken out of seasonal storage in the fall and the 180-Day Inspection is being done just prior to the suit being placed in seasonal storage in the spring. See paragraph 5-96 for storage requirements and storage clarification.

1. Fit assembly to aircrewmember, using procedure in paragraphs 5-67 thru 5-73.

2. Perform a 360-Day Inspection (paragraph 5-89).

5-88. SPECIAL INSPECTION (180-DAY). The 180-Day Special Inspection shall be performed at the organizational level on all in-service A/P22P-6 Series assemblies. To perform the 180-Day Special Inspection, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Lubricant Stick	Zipperease NIIN 00-999-7548

1. If required, clean assembly components in accordance with paragraph 5-92.

2. Inspect CWU-62/P series coverall assembly as follows:

- a. Place coverall on a flat, clean surface.
- b. Inspect surface of coverall, wrist seals, neck seals, and socks for damaged fabric, holes and loose or broken stitching.

NOTE

Absence of cotton flocking does not degrade performance of SRU-25/P socks or neck and wrist seals on the CWU-62/P coverall.

NAVAIR 13-1-6.7-2

c. Inspect slide fasteners for damaged chain, loose teeth, improper chain alignment, damaged or split end seal blocks, damaged or missing pull tabs (metal and fabric), and loose slide fastener tape.

d. Turn coverall inside out, repeat steps b and c and inspect seam tapes for looseness or fraying.

e. Apply a coating of lubricant to slide fasteners using a lubricant stick.

f. Turn coverall right side out. Inspect slide fastener for proper operation. Inspect overall condition of coverall.

g. If repairs are necessary, other than those indicated in note of paragraph 5-81, forward coverall with damage chart (figure 5-11 or 5-12) detailing discrepancies, to intermediate level maintenance facility for repair and/or further testing.

3. Deleted.

4. Document inspection in accordance with OP-NAVINST 4790.2 Series.

5-89. 360-DAY INSPECTION. The 360-Day Inspection shall be performed at the intermediate level on all A/P22P-6 Series assemblies prior to placing in service and every 360 days thereafter. To perform the 360-Day Inspection, proceed as follows:

1. Perform all steps of 180-Day Inspection in accordance with [paragraph 5-88](#).

2. Perform water test on the CWU-62/P series coverall in accordance with [paragraph 5-91](#).

3. Repair assembly if required in accordance with [paragraph 5-97](#).

4. Document inspection in accordance with OP-NAVINST 4790.2 Series.

5-90. WATER TEST DEVICE.

WARNING

Prior to conducting water test the Aircrew Survival Equipmentman must be familiar with the water test device operating procedures in NAVAIR 17-15GB-504.

NOTE

Replacement water pumps, annotated in the 17-15GB-504, are no longer available. To replace a failed water pump, use 4320-01-384-0773 as a suitable substitute.

5-91. WATER TEST. The water test is a two-person operation. To perform the water test, proceed as follows:

NOTE

Water Testing criteria for the CWU-79 Series Coveralls shall be: One (1) drop of water falling from the underside of the coverall in 10 seconds or less shall be repaired.

Materials Required

Quantity	Description	Reference Number
1	Water Test Device	MIL-W-85635
As Required	Bleach, Laundry (Powder or Liquid)	A-A-1427 NIIN 00-598-7316 or commercial
1	Pencil, China Marking	SS-P-196
1	Chalk	SS-C-266
2	Wrist Clamp	Supplied with Water Test Device (See Note)

Materials Required (Cont)

Quantity	Description	Reference Number
1	Neck Clamp	Supplied with Water Test Device (See Note)
As Required	Fastener Tape, Hook, Type II, Class 1, 2 Inches Wide	MIL-F-21840 NIIN 00-450-9837 NIIN 00-926-4931 NIIN 00-405-2267
As Required	Fastener Tape, Pile, Type II, Class 1, 2-Inches Wide	MIL-F-21840 NIIN 00-405-2265 NIIN 00-498-6631 NIIN 00-926-4930
As Required	Rag, Wiping	A-A-2522 NIIN 00-205-1711 or equivalent

Note: An alternate neck/wrist seal clamp may be fabricated locally in accordance with [paragraph 5-246](#).

1. Ensure water test device ([figure 5-13](#)) is ready for operation by checking the following:

a. Fill water reservoir to fill line with (approximately 30 to 35 gallons) clean, fresh water.

CAUTION

Do not exceed 1/4 cup of bleach for each water reservoir full of water. Reservoir shall be drained and water replaced at least monthly or more often if water becomes dirty, slimy, or stagnant.

b. One-quarter cup of bleach shall be mixed with water at initial filling and at each subsequent refilling of reservoir.

c. Ensure hose is connected to pump.

d. Ensure electrical cord is connected to a three-prong grounded outlet, 115V, 60-Hz power source.

NOTE

Water test device is equipped with a ground fault interrupter that will turn electrical power off in the event that electrical circuit is not properly grounded.

2. Lock inspection platform in horizontal position with upper platform open as shown in [figure 5-14](#).

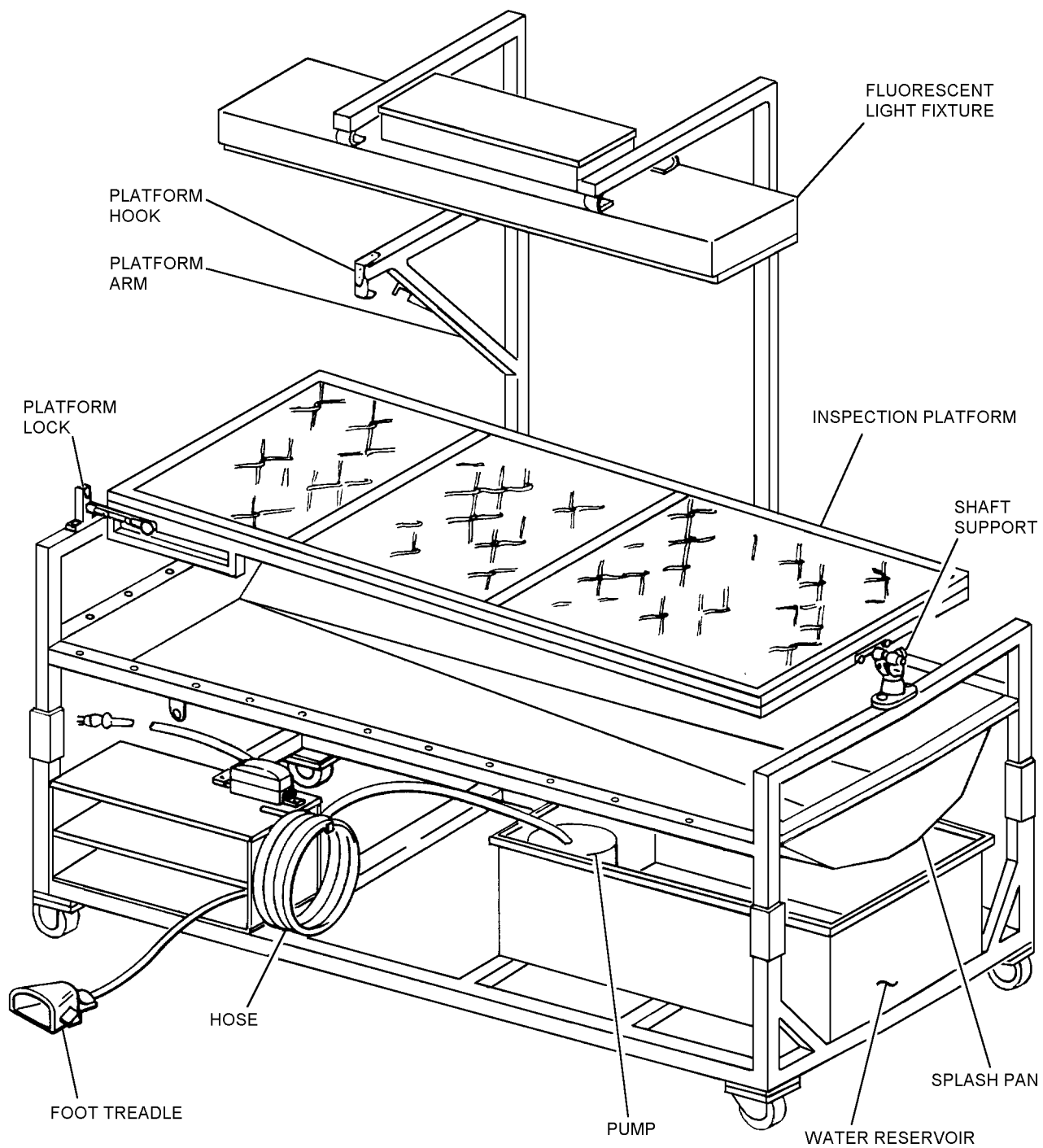
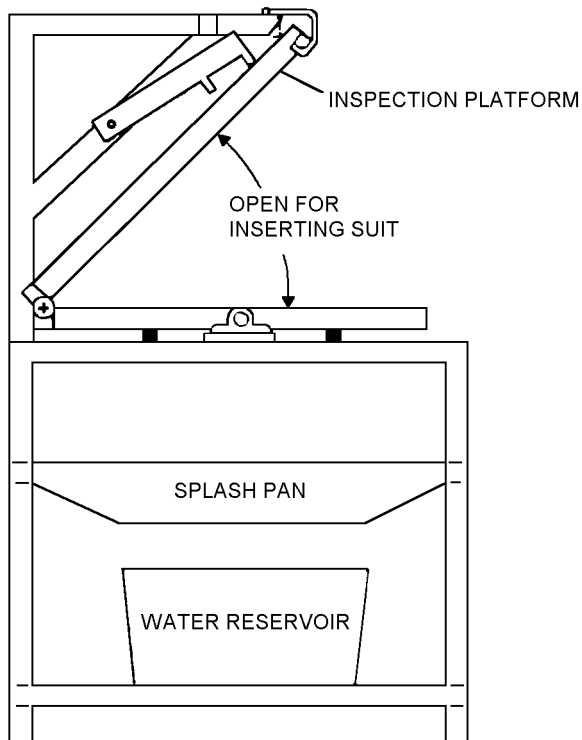


Figure 5-13. Water Test Device



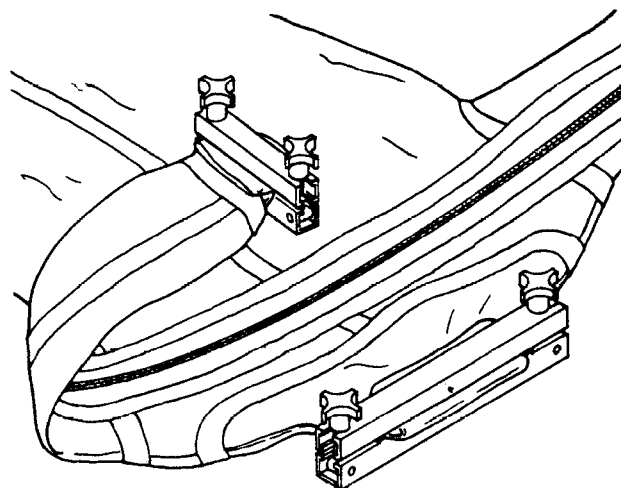
5-14

Figure 5-14. Water Test Device (End View)

Prior to beginning test, remove watches, rings, and any other sharp objects. Care should be taken while placing coverall into inspection platform so that nothing catches the coverall that might cause punctures or tears to the material. Also, ensure coverall does not get pinched when platform is closed.

3. Turn coverall to be inspected inside out and fully close both slide fasteners. Lay coverall on bottom half of inspection platform, positioning neck opening to left and entrance slide fastener facing up.

4. Close off left wristlet (wristlet closest to platform hinge) and neck opening with clamps provided. Openings should be folded prior to clamping to avoid leakage.

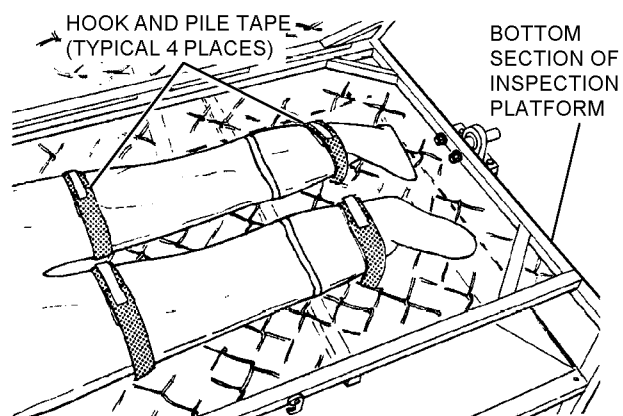


5p91s4

Step 4 - Para 5-91

Ensure that there are no twists or folds and garment is not pinched.

5. Strips of 2-inch pile tape shall be routed through bottom section of inspection platform and loosely around socks above ankle area prior to filling coverall with water to minimize stretching of socks. Secure in place with hook tape.



5p91s5

Step 5 - Para 5-91

6. Strips of 2-inch pile tape shall be routed through bottom section of inspection platform and loosely around each thigh, just below crotch, to help separate legs to facilitate visual inspection. Secure in place with hook tape.

7. Extend sleeve of coverall through opening provided in side of inspection platform and close top gate. Secure all four latches.

WARNING

Coveralls must be filled with water as described below. Do not attempt to shortcut filling procedures.

NOTE

Ensure bottom portion of remaining clamp with knobs is in hanger provided in top of fixture prior to filling coverall with water. Place top portion of clamp within easy reach of operator. Water test shall be performed in one complete cycle, start to finish, without interruption.

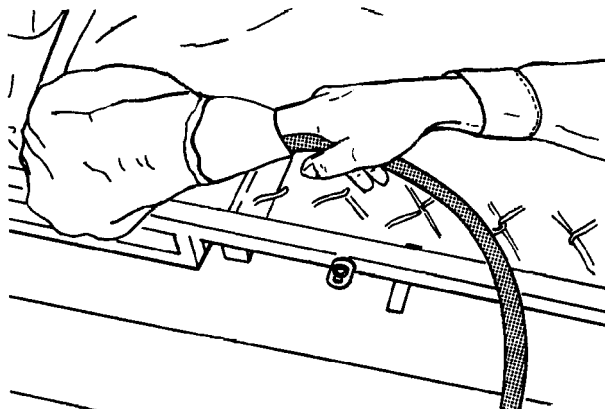
8. Insert two fingers into sleeve opening. Place hose in sleeve.

NOTE

If water does not flow from hose within 5 seconds after operating foot switch, prime pump by switching on and off several times.

9. While holding hose and arm, turn pump on by depressing footswitch and fill coverall to within 6

inches of sleeve opening. Allow trapped air to escape through sleeve opening while filling.



Step 9 - Para 5-91

5p91s9

10. Turn pump off. Remove hose. Gently rock the coverall back and forth in the test stand to dislodge any stray air pockets that may be inside the suit. Close sleeve opening with clamp.

CAUTION

Do not mark coverall with ballpoint pen or lead pencil.

11. While the inspection platform is in the horizontal position, inspect back of the coverall for leaks, including areas under the thigh and ankle securing tapes by temporarily loosening the hook and pile closures. Where water appears on coverall surface, blot area dry with an absorbent material (paper towel, etc). If one (1) drop of water falls from the underside of the coveralls in 10 seconds or less, the coverall shall be repaired. Mark suspect area for patching using only china marking pencil or tailor's chalk.

NOTE

Assistance may be required to hold the platform in position during step 12. Ensure that securing tapes at thighs and ankles are closed prior to rotating platform.

12. Rotate the inspection platform 180° and inspect the front of the coverall and slide fastener box stitching near seal block for any water leakage. If water appears, mark area for repair. Inspect and mark leak areas in accordance with step 11 procedures.

13. Rotate platform back to original horizontal position and lock in place.

14. After marking all areas requiring repair, remove fill-arm clamp and slowly drain water into splash pan.

15. Open inspection platform, remove hook and pile tape used to secure thighs and ankles, remove clamps, and drain any remaining water.

16. Open entrance slide fastener and turn coverall right side out.

NOTE

When patching of the coverall is required, drying of the defective area of the CWU-62/P can be accomplished by subjecting the area to low-pressure air or by a five second application of the MIL-S-85634 seam and patch heat sealing machine. When drying the full garment in a clothes dryer, place the garment in a locally fabricated mesh bag to minimize possible abrasion. An appropriate mesh material can be purchased from: Sterling Net and Twine Co., Inc., 18 Label Street, Montclair, NJ 04042. Phone (201) 783-9800.

17. With slide fasteners open, dry coverall in a clothes dryer set at its lowest temperature setting for 20 minutes, or hang coverall on wooden or plastic hanger and allow to air dry. After hanging for a maximum of 4 hours, check coverall for dryness. If water has collected inside anti-exposure socks, pull socks out through entrance opening and allow to dry.

5-92. CLEANING.

NOTE

Refer to sections 3-27A and 3-17A for cleaning mittens and hood.

5-93. CLEANING AND TREATMENT OF CWU-62/P SERIES AND CWU-79/P COVERALLS.

For cleaning and treatment of coveralls proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Detergent, General Purpose	MIL-D-16791 NIIN 00-282-9699 or Equivalent or Commercial*
As Required	Trichloroethylene	O-T-634

*Cold Power, low sudsing powdered detergent, or equivalent, recommended for cold water.

CAUTION

Ensure that slide fasteners are closed prior to laundering/cleaning. Do not dry-clean coveralls. Do not use bleaches or similar additives for cleaning. Do not use commercial laundry facilities. Trichloroethylene shall be used, for spot cleaning only.

1. Spots and areas suspected of having been in contact with acid compounds, grease, oil, etc, shall be swabbed with trichloroethylene.

2. Close slide fastener. Hand launder or use an automatic washer that has a delicate cycle. Ensure water used is cold. Follow detergent manufacturer's recommendations for amount of detergent to use. Wash cycle shall not exceed 3 minutes.

3. Rinse garment three times. Use clean, fresh water for each rinse. Each rinse cycle shall be a minimum of 1 minute.

NOTE

Coveralls may be dried in a clothes dryer, using lowest heat setting, for 20 minutes. Recommend garment be placed in a locally fabricated mesh bag to minimize potential abrasive wear. Appropriate mesh material can be purchased from: Sterling Net and Twine Co., Inc., 18 Label Street, Montclair, NJ 04042. Phone: (201) 783-9800.

4. Hang coverall by shoulders on a wooden or plastic hanger in a well-ventilated area until dry, or tumble dry with low heat.

5. When outside is dry, turn legs and socks inside out to dry.

5-94. Deleted.

5-95. Deleted.

5-96. STORAGE. To store the anti-exposure coveralls/assemblies, proceed as follows:



The coveralls should be stored in a cool, dark place as prolonged exposure to the sun's ultra-violet rays or other sources of ozone will degrade the adhesives and all types of rubber. Keep coveralls away from gasoline, oil and other petroleum products as they dissolve adhesives.

Do not insert hanger through neck seal opening when preparing coveralls for short term storage. Ends of hanger could puncture and damage the neck seal. Insert hanger through entry zipper and push hanger head from below through the neck seal opening.

1. Short-Term Storage. Between flights, coverall shall be hung on a plastic or wooden hanger or folded in accordance with [Figure 5-15](#), and stored in a clean and well ventilated protected area.

2. Seasonal Storage. Storage during the warmer months when anti-exposure protection is not required for flight. Coveralls in Seasonal Storage shall be maintained on their normal 180/360-day inspection cycles and do not require a Place-In-Service Inspection upon removal from seasonal storage. Seasonal storage does not require documentation as "Seasonal Storage".

3. Long-Term Storage. Coveralls being stored rather than being maintained on a 180/360-day inspection cycle (for whatever reason) shall be considered in Long-Term Storage. A coverall that has gone beyond its 180 or 360-Day Inspection shall be considered out of service and in Long-Term Storage and must be documented as such in accordance with OPNAVINST 4790.2 Series. Coveralls being removed from Long-Term Storage shall have a complete Place-In-Service Inspection completed and documented in accordance with [paragraph 5-87](#).

4. CWU-79/P and CWU-83/P Anti-Exposure suits that are kept on the 360-day inspection cycle and put away during the warmer months are not considered in Long-Term Storage with regard to inspection criteria. Rather the suits are considered in Seasonal Storage. There is no requirement to do an additional Place-In-Service, 360-Day Inspection on suits being taken out of seasonal storage as long as the suit has been maintained on the required 360-day inspection cycle.

NOTE

Although there is no requirement for anti-exposure suits to be inspected at certain times of the year, the best maintenance practice for the suit is to time the cycle of inspections so that the 360-Day Inspection is being done as the suit is taken out of seasonal storage in the fall and the 180-Day Inspection (if required) is being done just prior to the suit being placed in to seasonal storage in the spring.

5. The mittens/gloves, hood and liner of the A/P22P-6 Series assemblies shall be placed with the coveralls during periods of storage. The CWU-43/P drawers (or equivalent) and the CWU-44/P (or equivalent) shall be retained by the individual aircrewmember and not put into storage.

6. Ensure that coveralls are clean and completely dry.

7. Lubricate and close slide fasteners on coveralls to within 4 inches of end seal blocks.

8. Fold coveralls in accordance with figure 5-15. Place coveralls in individual plastic bags and clearly label with aircrewmember's name and organization.

9. Loosely pack bagged coveralls in a cruise box or other appropriate storage container.

10. Store closed containers in a cool dry area.

5-97. REPAIRS AND FABRICATIONS.

5-98. Instructions for performing repairs or replacement of components of the A/P22P-17 or the A/P22P-6 Series assemblies in Ready For Issue (RFI) condition can be found in the following paragraphs. Repairs and fabrications of the coveralls shall include, but are not limited to, those listed in table 5-8. If maintenance activity performing repairs is shore based, CWU-62/P series or CWU-79/P coveralls shall be leak tested in accordance with paragraph 5-91 after repairs are made. If the maintenance activity is deployed aboard ship, inspection after Emergency Repairs can be made by Intermediate Level Maintenance in accordance with paragraph 5-99. CWU-79/P Neck

and Wrist Seal pinholes can be repaired using Aqua Seal following manufacturer's instructions.

CAUTION

Do not apply adhesive to coverall fabric except where specified.

NOTE

Refer to sections 5-6 and 5-9 for authorized repairs of mittens, and 5-7 and 5-8 for authorized repairs of hood. Repair procedures for CWU-43/P drawers and CWU-44/P undergarments may be found in chapter 3.

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch 7 to 10 stitches per inch. Backstitch all ends not less than 3/4-inch.

WARNING

The following procedure is only to be used by deployed units when water testing is not available. Extreme attention to detail must be followed to prevent injury to personnel assigned the CWU-62 Series or CWU-79/P Anti-Exposure Coverall.

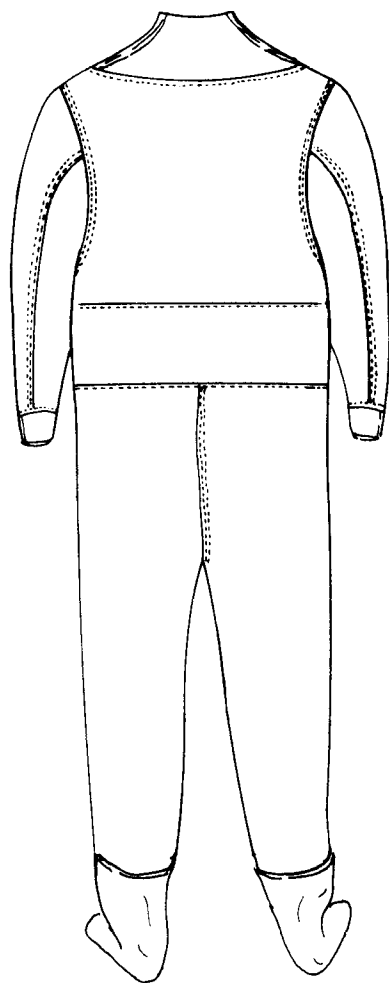
5-99. After repair and/or patching coverall, perform visual inspection as follows:

1. Sewing for loose/missing stitches.
2. Heat seal tape for loose ends and edges for separation of tape from coverall.
3. Slide fasteners for proper functioning.
4. All seams for loose tape, separation, cuts, and tears.
5. Neck and wrist seals for damage and proper bonding to the coverall.
6. Socks for proper attachment to coverall.
7. Assembly for cuts, tears, abrasions, and deterioration.

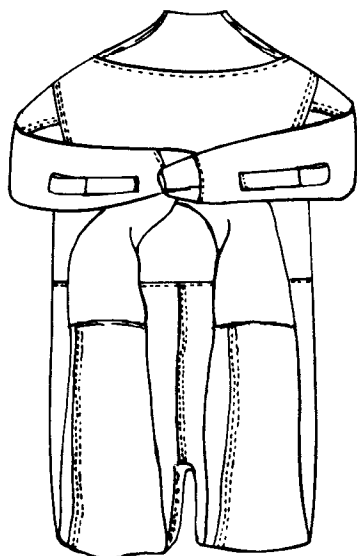
NOTE

Completion of inspection shall Conditionally RFI the coverall until returning to a shore based Intermediate Maintenance Level Activity.

8. Document maintenance actions in accordance with OPNAVINST 4790.2 Series.



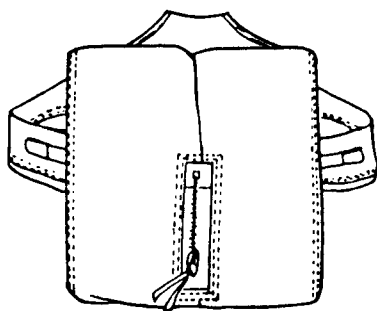
STEP 1



FOLD ARMS IN

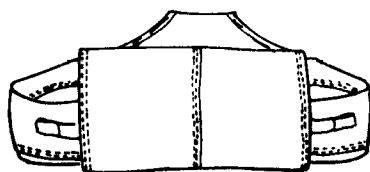
FOLD LEGS
FIRST TIME

STEP 2



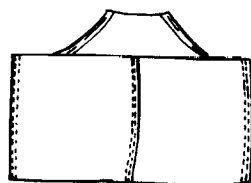
FOLD LEGS
SECOND TIME

STEP 3



FOLD LEGS
AND BODY OF
COVERALL

STEP 4



TUCK SLEEVES
BETWEEN FOLDS
2 AND 3 OF
COVERALL

STEP 5

Figure 5-15. Folding Procedures for the CWU-62/P Series Coveralls

Table 5-8. Repairs and Fabrications

Component	Discrepancy	Repair Authorized	Reference/Note
CWU-62/P Series or CWU-79/P Series or ARSD Series or MSD 560 Series	Patching and Reinforcement Limitations	Yes	Pa 3-116 (Not 3/5)
	Porous fabric:		(Not 1)
	Small: Less than 1-inch diameter circle	Yes	Pa 3-104 (Not 3)
	Large: Less than 7 inches by 7 inches	Yes	Pa 3-104C (Not 6)
	Hole:		(Not 2)
	Small: Pinhole; less than 1/16-inch diameter	Yes	Pa 3-104 (Not 3)
	Large: Less than 3-inch diameter	Yes	Pa 3-104B (Not 6)
	Tear:		(Not 3)
	Small: Up to 1 inch long w/1/2-inch long cross cut.	Yes	Pa 3-104 (Not 3)
	Large: Less than 7 inches in length with 1/2-inch long cross-wise cut(s)	Yes	Pa 3-104A (Not 6)
	Rip:		(Not 4)
	Small: Up to 1 inch long.	Yes	Pa 3-104 (Not 3)
	Large: Less than 10 inches in length	Yes	Pa 3-104A (Not 6)
	Hole, Tear or Rip continuing through a seam	No	
	Replacement of slide fasteners	Yes	Pa 3-101
	Repair of slide fastener	Yes	Pa 3-100
	Repair of water seepage at box stitching	Yes	Pa 3-102
	Thumb loop replacement	Yes	Pa 3-103
	Loose Construction Seam Tape Replacement	Yes	Pa 3-104D
	Replacement of wrist seals (CWU-62/P Series)	Yes	Pa 3-108
	Replacement of wrist seals (CWU-79/P Series)	Yes	Pa 3-41
	Replacement of wrist seals (ARSD)	Yes	Section 3-5A
	Replacement of neck seals (CWU-62/P Series)	Yes	Pa 3-109
	Replacement of neck seals (CWU-79/P Series)	Yes	Pa 3-40
	Replacement of neck seal (ARSD)	No	(Not 7)
	Replacement of Exhaust Valve (ARSD)	Yes	Section 3-5A
	Replacement of loose or missing hook/pile tape (ARSD)	Yes	Section 3-5A
	Replacement of loose or missing reflective tape (ARSD)	Yes	Section 3-5A
	Replacement of Chest Pad (ARSD)	Yes	Section 3-5A
Anti-Exposure Sock	Porous Fabric: Small ONLY	Yes	Pa 3-104 (Not 3)
	Holes: Small (Pinholes) ONLY	Yes	Pa 3-104 (Not 3)
	Tear: Small ONLY	Yes	Pa 3-104 (Not 3)
	Hole, Tear or rip continuing through a seam	No	
	Repair/Replacement of loose seam tape	Yes	Pa 3-104E
	Replacement of sock	Yes	Pa 3-105
CWU-23/P Liner	Tears, Rips, Holes	Yes	Pa 3-250P
	Slide Fastener	Yes	Pa 3-250P
	Replacement of sleeve insert	Yes	Pa 3-250Q
CWU-72/P,	Tears, Rips, Holes	Yes	Pa 3-250AG
	Slide Fastener	No	
	Replacement of hook and pile tape	Yes	Pa 3-250AG

Table 5-8. Repairs and Fabrications (Cont)

Component	Discrepancy	Repair Authorized	Reference/Note
CWU-81/P, or CWU-82/P Liners	Tears, Rips, Holes	Yes	Para 3-250AY
	Slide Fastener	No	
	Replacement of hook and pile tape	Yes	Para 3-250AY

Notes: 1. Porous Area. Fabric that is visibly intact yet still leaks. Criteria shall be: If one (1) drop of water falls from the underside of the coveralls in 10 seconds or less the coverall shall be repaired.
2. Hole, round damage; an entire circular or elliptical shape missing from the fabric.
3. Tear; L or I shaped damage; that is a long continuous cut with a short connected perpendicular cut at one or both ends. Tears of 1/2 inch in length or greater in coverall fabric shall be closed with zigzag stitching prior to application of patches.
4. Rip, linear damage; that is, a long continuous cut with no other adjoining cuts. Rips larger than 1/2 inch.
5. Reinforcing: Repairing a small tear, small rip, small hole or small porous area by heat seal tape alone. See paragraph 3-116 for definitions and limitations.
6. Patching: Repairing a tear, rip, or hole by sewing a new piece of fabric or heat seal tape along the perimeters of the damage. When taping those sewn edges. See paragraph 3-116 for definitions and limitations.
7. Neck Seal on ARSD must be replaced at either Mustang or Concord in accordance with Section 3-5A.
8. Replacement of slide fasteners shall be accomplished at the discretion of the repairing activity.
9. Dimensions and limitations for patching and reinforcing liners is not the same as for the coveralls. Repair dimensions of the liners is covered under paragraph 3-112.

5-100. REPAIR OF SLIDE FASTENERS. To repair any dried adhesive which may have separated from the inside rubber tape portion of the slide fastener, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Polychloroprene Adhesive (Not E)	MIL-A-5540 NIIN 00-515-2246
1	Roller, Hand	GGG-R-00620 NIIN 00-243-9401
As Required	Toluene	TT-T-548
As Required	Talc	MIL-T-55036 NIIN 01-080-9589

Notes: 1. Adhesives may come from supply that contain both a base adhesive and an accelerator. Mixing of the accelerator with the base adhesive is not recommended for use on any items requiring adhesive in this manual. Use only the base adhesive.

NOTE

Repairs are required only if water leakage occurs.

1. Remove old seam tape with heat sealer.
 2. With dental spatula or appropriate tool, clean adhesive off rubber.
 3. Clean area to be repaired with toluene. Wipe with a soft rag. Let cleaned area dry for 20 minutes.
 4. Place 2 coats of adhesive on the rubber tape area and on the back portion of the cleaned area of the slide fastener.
- NOTE**
- Ensure that adhesive is getting into the seam area between the dried adhesive and the slide fastener.
5. When tacky, press surfaces together with a roller.
 6. After rolling, allow 48 hours to dry. Retest for leaks in accordance with paragraph 5-91. If necessary, repeat procedure.
 7. Seam leakage around slide fasteners can be corrected by applying 2 layers of adhesive over the heat seal tape and slide fastener rubber.

- a. Mark a 2-inch area from the rubber over the heat seal tape.
- b. Apply first layer of adhesive in a right to left application.

c. Apply second layer of adhesive in an up and down application. Let dry.

d. Apply a light coat of talc over the adhesive area when completely dry and retest in accordance with paragraph 5-91.

5-101. REPLACEMENT OF SLIDE FASTENER.

To replace entrance or relief portal slide fastener, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Tape, Seam, 1 1/2-Inch	NIIN 01-193-0469
	-or-	
	Tape, Seam, 7/8-Inch	NIIN 01-189-6361
As Required	Thread, Nylon, High Temperature Resistant	MIL-T-83193 NIIN 00-130-6245
As Required	Polychloroprene Adhesive (Not E)	MIL-A-5540 NIIN 00-515-2246
1	Roller, Hand	GGG-R-00620 NIIN 00-243-9401
1	Pencil, China Marking	SS-P-196
1	Spatula, Dental	No. 324 NIIN 00-556-8000 or equivalent

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Toluene	TT-T-548

Notes: 1. Adhesives may come from supply that contain both a base adhesive and an accelerator. Mixing of the accelerator with the base adhesive is not recommended for use on any items requiring adhesive in this manual. Use only the base adhesive.

1. Prior to removing defective slide fastener, make alignment marks on coverall and slide fastener using a China marking pencil. Marks should be made at 1/4, 1/2 and 3/4 length sections of slide fastener.

2. To remove existing slide fastener from coverall, cut stitching being careful not to nick or damage fabric. Peel cloth layer of heat seal tape off. Remove any remaining stitches or threads from the area around the slide fastener.

CAUTION

Use care when scraping off adhesive to avoid damaging the fabric.

3. Apply heat, using heat sealer, to soften remaining adhesive. Gently scrape off as much adhesive as possible using a dental spatula or equivalent.

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4. Select correct size slide fastener from table 5-9. Clean the tapes of the new slide fastener with toluene. Wipe with a soft rag. Let cleaned area dry for five minutes. Transfer alignment marks from the used slide fastener to the new one. Place new slide fastener in the opening left from the previous fastener, making sure to match the alignment marks. Slide fastener may close from right to left or left to right, depending on aircrew preference.

5. Sew one row of stitches (5 to 7 stitches per inch) around opening, stitching through all layers (fabric and slide fastener tape) 1/16 inch from folded edge of fabric, following the pattern left by previous stitching. Sew a second row of stitches 1/8 inch from first row of stitches.

6. On inside, apply two thin coats of adhesive to all four edges of slide fastener tape, covering and extending at least 3/8 inch beyond rows of stitching. Seam tape will not adhere properly to slide fastener tape without the use of adhesive. Allow 15 minutes between each coat. Allow a minimum of 48 hours drying time for adhesive before heat sealing. Let dry completely.

WARNING

Prior to application of seam tape, Aircrew Survival Equipmentman must be familiar with heat sealing machine operating procedure 5-104. NAVAIR 17-10DC-1. Reference paragraph 5-104 for application of seam tape.

NOTE

When applying seam tape, ensure tape and coverall material are not wrinkled or bunched before lowering heat platen. If using 1 1/2-inch seam tape, only one layer of seam tape shall be applied. One and one half inch tape is preferred. If 7/8-inch tape is used, two overlapping layers of seam tape shall be applied.

7. Apply seam tape in accordance with paragraph 5-104, to inside, keeping stitch lines and edge of slide fastener tape as nearly centered under tape as possible. Tape shall extend at least 1/4 inch beyond stitching and edge of slide fastener tape. Overlap ends of seam tape 1 inch.

8. Ensure that a thong is looped through the slide fastener pull and securely tied using a larkshead knot. Fabricate the thong using 10 1/4 inches of 5/16-inch wide nylon tape, MIL-T-8363, Type 1. The ends of the thong shall be cut on an angle of approximately 60 degrees. Sear ends of thong and allow no sharp edges to be formed.

9. Perform leakage test on coveralls in accordance with paragraph 5-91.

5-102. REPAIR OF WATER SEEPAGE AT BOX STITCHING. To prevent water seepage through the box stitching in the inside rubber tape area of the slide fastener assembly, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Polychloroprene Adhesive (Not)	MIL-A-5540
As Required	Toluene	TT-T-548

Notes: 1. Adhesives may come from supply that contain both a base adhesive and an accelerator. Mixing of the accelerator with the base adhesive is not recommended for use on any items requiring adhesive in this manual. Use only the base adhesive.

1. Clean area with toluene. Wipe with a soft rag. Let dry for 20 minutes.

2. Apply at least 3 coats of adhesive to the box stitching area. Allow at least 15 minutes of drying time between each coat.

3. Allow 48 hours to dry. Retest for leaks in accordance with paragraph 5-91. If necessary, repeat procedure.

5-103. THUMB LOOP REPLACEMENT. To replace worn or damaged thumb loops, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Fastener Tape, Hook, Type I, Class 1, 1-Inch Width, Sage Green	MIL-F-21840 NIIN 00-405-2266
As Required	Fastener Tape, Pile, Class 1, 1-Inch Width, Sage Green	MIL-F-21840 NIIN 00-405-2263
As Required	Thread, Nylon, High Temperature Resistant Sage Green -or- Thread, Nylon, Type II Size E, Sage Green	MIL-T-83193 NIIN 00-130-6245 V-T-295 NIIN 00-204-3884

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Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Seam Tape, 1 1/2-Inch	NIIN 01-193-0469
	-or-	
	Seam Tape, 7/8-Inch	NIIN 01-189-6361

1. Remove damaged thumb loop fastener tapes from sleeve, being careful not to damage coverall fabric.

2. Cut 6-inch length of hook fastener tape. Position hook tape on sleeve, using original stitching lines as a guide. Attach hook tape to sleeve with a single row of stitching, 1/8 inch from edge on all sides.

3. Cut 8-inch length of pile fastener tape. To form thumb loop, fold tape back 2 inches from end, with pile side facing out. Stitch across end; backstitch across full width.

4. With pile side facing hook side, align bottom edge of pile tape with bottom edge of hook tape. Stitch across end, through all thicknesses, 1/8 inch from edge. Backstitch across full width.

Table 5-9. Replacement Slide Fasteners

Anti-Exposure Coverall	Coverall Size	Zipper Length (Not E1)	Part Number (Not E2)	NIIN	Cost (each) (Not E3)	
					1 to 5 zippers	6 to 10 zippers
CWU-62/P, 62A/P & 74/P	Relief zipper	6	0720/6 or 1370AS501-5	01-323-8118	\$63.20	\$57.49
CWU-62/P, 62A/P & 74/P	Relief zipper	8	0720/8		\$65.53	\$59.61
CWU-62/P, 62A/P & 74/P	1, 2, 3	28	0720/28 or 1370AS501-1	01-323-2385	\$88.85	\$80.82
CWU-62/P, 62A/P & 74/P	4, 5, 6	30	0720/30 or 1370AS501-2	01-323-2386	\$91.18	\$82.95
CWU-62/P, 62A/P & 74/P	7, 8, 9	32	0720/32 or 1370AS501-3	01-323-8117	\$93.52	\$85.07
CWU-62/P, 62A/P & 74/P	10, 11, 12	34	0720/34 or 1370AS501-4	01-323-8118	\$95.85	\$87.19
CWU-62B/P	Relief zipper	6	0720/6		\$63.20	\$57.49
CWU-62B/P	1, 2, 3	34	0720/34 or 1370AS501-1	01-323-2385	\$95.85	\$87.19
CWU-62B/P	4, 5, 6	38	0720/38		\$100.51	\$91.43
CWU-62B/P	7, 8, 9	42	0720/42		\$105.18	\$95.68
CWU-62B/P	10, 11, 12	46	0720/46		\$109.84	\$99.92
CWU-62C/P	Small/Short	36	0720/36		\$98.18	\$89.31
CWU-62C/P	Small/Regular	38	0720/38		\$100.51	\$91.43
CWU-62C/P	Small/Long	40	0720/40		\$102.85	\$93.55
CWU-62C/P	Medium/Short	38	0720/38		\$100.51	\$91.43
CWU-62C/P	Medium/Regular	40	0720/40		\$102.85	\$93.55
CWU-62C/P	Medium/Long	42	0720/42		\$105.18	\$95.68
CWU-62C/P	Large/Short	40	0720/40		\$102.85	\$93.55
CWU-62C/P	Large/Regular	42	0720/42		\$105.18	\$95.68
CWU-62C/P	Large/Long	44	0720/44		\$107.51	\$97.80
CWU-79/P	12	34	0720/34 or 1370AS501-1	01-323-2385	\$95.85	\$87.19

Table 5-9. Replacement Slide Fasteners (Cont)

- Notes: 1. Length is measured from zip stop to zip stop (length of teeth).
 2. Not all anti-exposure coverall slide fasteners were procured and stocked in the Navy Supply System. To open purchase slide fasteners above that do not have associated part numbers and NIINs (part numbers that begin 0720/ are manufacturer's part numbers) contact YKK inc. via Diversified Marketing Group. Please keep in mind that the individual contact person may change from time to time but the basic contact information is consistent and you will be able to open purchase the slide fasteners in Table 5-9 from the contact information provided. Call Julie A. Murray, Diversified Marketing Group, 109 Forrest Avenue, Narberth, PA 19072. Telephone number: 610-667-5589. Fax number: 610-667-4666. Email: Julie@dmgroup.org.
 3. Cost provided is per slide fastener. The price per slide fastener goes down as the number ordered goes up.

5. On inside of sleeve, apply seam tape over stitching lines in accordance with paragraph 5-104.

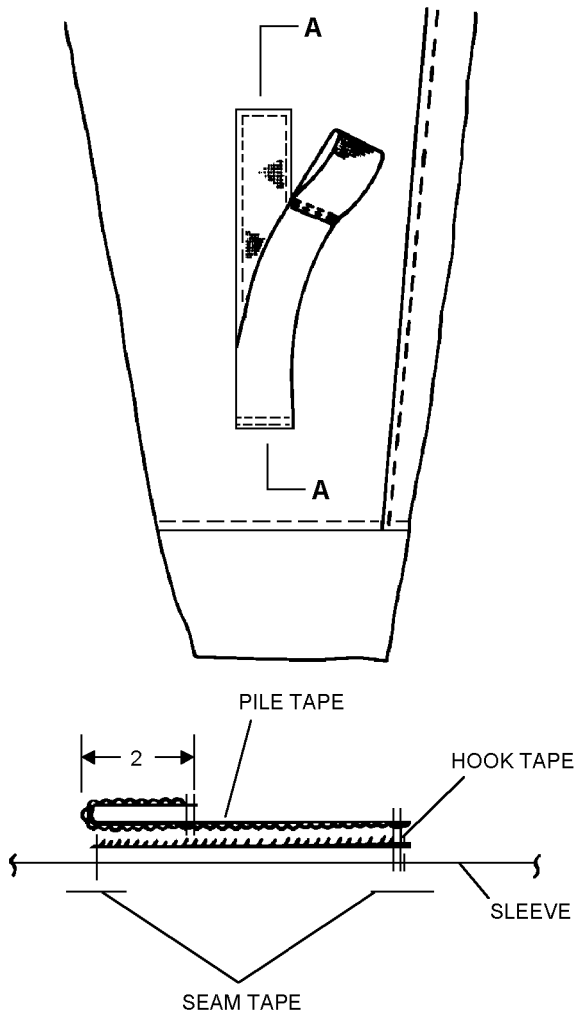
CAUTION

Do not close any tears in socks, wrist or neck seals with machine stitching.

NOTE

These procedures shall be performed at the Intermediate Level.

All patching shall extend a minimum of 1/2 inch beyond damaged areas. Patches may be overlapped to achieve a 1/2 inch margin.

**SECTION A-A****Steps 2 thru 5 - Para 5-103**

5p103s2

5-104. PATCHING SMALL TEARS, SMALL RIPS, SMALL POROUS AREAS AND SMALL HOLES (PINHOLES). To apply 2-inch diameter heat circle patches or seam tape reinforcement, proceed as follows using the repairable dimensions below:

Materials Required		
Quantity	Description	Reference Number
1	Sewing Machine, Zigzag Single or Double Throw	—
As Required	Thread, Nylon High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-130-6245
	-or-	
	Thread, Nylon Size E, Type II Sage Green	V-T-295 NIIN 00-204-3884
1	Sealer, Heat, Seam and Patch	MIL-S-85634
As Required	Heat Circle Patches, 2-Inch Diameter	NIIN 01-192-2489
As Required	Seam Tape, 1 1/2-Inch	NIIN 01-193-0469
	-or-	
	Seam Tape, 7/8-Inch	NIIN 01-189-6361
1	Roller, Hand	GGG-R-00620 NIIN 00-243-9401
1	Torque Wrench, 0-100 lb-in.	—
As Required	Cloth, Special	MIL-C-85637 NIIN 01-196-0076

WARNING

Prior to application of seam tape, Aircrew Survival Equipmentman must be familiar with heat sealing machine operating procedures in NAVAIR 17-10DC-1. Do not allow any coverall material threads or sewing machine thread to protrude from under seam tape.

1. Turn heat sealing machine (figure 5-16) to ON and wait 10 minutes for visual thermometer to stabilize at 350°F. If temperature is incorrect, adjust temperature control knob.

CAUTION

Temperature is critical; do not overheat.

NOTE

Seam tape is applied to the inside surface of the coverall.

Teflon paper that covers the heat platen can be ordered under NIIN 9330-01-449-5206.

2. Center area to be repaired on anvil pad, ensuring only one layer of fabric is on anvil and there are no wrinkles in fabric.

NOTE

Normal use requires periodic torque pressure adjustment of bolt to 75 ±2 lb-in.

3. Center patch, film-side down, on fabric of the coveralls.

4. Bring heat platen down, locking it in place.

5. Set timer for 25 seconds. When timer bell sounds, raise heat platen.

6. Smooth out wrinkles and air pockets with hand roller to prevent water leakage.

7. Perform leak test in accordance with paragraph 5-91.

8. Document in accordance with OPNAVINST 4790.2 Series.

5-104A. PATCHING LARGE TEARS OR LARGE RIPS. To patch large tears or rips, proceed as follows:

CAUTION

High temperature resistant thread shall be used unless not available in supply. High temperature resistant thread does not propagate flame; nylon thread does.

NOTE

These procedures shall be performed at the Intermediate Level.

All patching shall extend a minimum of 1/2 inch beyond damaged areas. Patches may be overlapped to achieve a 1/2 inch margin.

Zigzag stitching shall be single or double width of throw, 5 to 7 stitches per inch (measured on one side of row). Stitches will vary according to smoothness of tear.

Straight stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 5 to 7 stitches per inch with minimum backstitch or over-stitch of 1 inch. Stitching shall be 1/8 inch from raw edges unless otherwise specified.

Materials Required

Quantity	Description	Reference Number
1	Sewing Machine, Zigzag Single or Double Throw	—
As Required	Thread, Nylon High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-130-6245
	-or-	
	Thread, Nylon Size E, Type II Sage Green	V-T-295 NIIN 00-204-3884
1	Sealer, Heat, Seam and Patch	MIL-S-85634
As Required	Heat Circle Patches, 2-Inch Diameter	NIIN 01-192-2489

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Seam Tape, 1 1/2-Inch	NIIN 01-193-0469
	-or-	
	Seam Tape, 7/8-Inch	NIIN 01-189-6361
1	Roller, Hand	GGG-R-00620 NIIN 00-243-9401
1	Torque Wrench, 0 - 100 lb-in.	—
As Required	Cloth, Special	MIL-C-85637 NIIN 01-196-0076

NOTE

Ensure area of coveralls to be patched has been thoroughly dried prior to patching. Round off corners of seam tape prior to application.

1. Lay suit on flat surface, with the inside of the damaged (white) area facing up. Butt damaged fabric edges together. Close tear with zigzag stitching or straight stitching if no zigzag machine is available.

2. With a china marker, mark a rectangular border around damaged area, at least 3/4 inch from raw edges.

3. Measure the dimensions of the damage border and, with a china marker, draw a duplicate shape on a new piece of Special Cloth. Cut out the repair piece.

4. Place repair piece (green side down) on top of the damage area (white side up). Sew repair rectangle to damage rectangle with 1 row of stitches 1/4 inch from rectangle edges.

5. Turn suit right side out. Sew along raw damaged edges to the repair rectangle using 2 rows of stitches 1/16 inch apart, and keeping 1/8 inch from raw damaged edges.

6. Turn suit inside out and apply 1 1/2-inch or 7/8-inch wide heat seal tape over all stitching per [paragraph 5-104](#).

7. Perform leak test in accordance with [paragraph 5-91](#).

8. Document in accordance with OPNAVINST 4790.2 Series.

5-104B. PATCHING LARGE HOLES. To patch large holes, proceed as follows:

CAUTION

High temperature resistant thread shall be used unless not available in supply. High temperature resistant thread does not propagate flame; nylon thread does.

NOTE

These procedures shall be performed at the Intermediate Level.

All patching shall extend a minimum of 1/2 inch beyond damaged areas. Patches may be overlapped to achieve a 1/2 inch margin.

If hole is larger than 3-inch diameter, suit has been exposed to atypical wear, and should be submitted to I-Level for possible condemning.

Zigzag stitching shall be single or double width of throw, 5 to 7 stitches per inch (measured on one side of row). Stitches will vary according to smoothness of tear.

Straight stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 5 to 7 stitches per inch with minimum backstitch or over-stitch of 1 inch. Stitching shall be 1/8 inch from raw edges unless otherwise specified.

Materials Required

Quantity	Description	Reference Number
1	Sewing Machine, Zigzag Single or Double Throw	—
As Required	Thread, Nylon High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-130-6245
	-or-	
	Thread, Nylon Size E, Type II Sage Green	V-T-295 NIIN 00-204-3884
1	Sealer, Heat, Seam and Patch	MIL-S-85634
As Required	Heat Circle Patches, 2-Inch Diameter	NIIN 01-192-2489

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Seam Tape, 1 1/2-Inch	NIIN 01-193-0469
	-or-	
	Seam Tape, 7/8-Inch	NIIN 01-189-6361
1	Roller, Hand	GGG-R-00620 NIIN 00-243-9401
1	Torque Wrench, 0 - 100 lb-in.	—
As Required	Cloth, Special	MIL-C-85637 NIIN 01-196-0076

1. Lay suit on flat surface, with the inside of the damaged (white) area facing up. With a china marker, mark a circular border around the hole, at least 3/4 inch from raw edges. Do not butt edges together.
2. Draw up to a 4-inch identical circle on a new piece of Special Cloth. Cut out the repair circle.

NOTE

(OPTIONAL) To make hemming easier, stitch 3/8 inch from unhemmed edge of circle, overlapping stitching and not back-stitching. Remove from sewing machine, leaving 6-inch tails of thread. Pull gently on the bobbin thread. This will force the outer edge of the circle to fold in on itself along the stitch line. Tie off the bobbin thread when the desired fold edge has been achieved.

3. Hem the repair circle by turning under 3/8 inch and stitching 1/8 inch from folded edge.
4. Turn the suit right side out. Center the repair circle over the damaged area, and make alignment marks at even quarters on both the repair circle and the suit.
5. Sew the repair circle to the suit using one row of stitches 1/16 inch from the hemmed edge, maintaining alignment.

6. Turn suit inside out. Tape the repair seams with 1 1/2-inch or 7/8-inch wide seam tape per paragraph 5-104.
7. Perform leak test in accordance with paragraph 5-91.

8. Document in accordance with OPNAVINST 4790.2 Series.

5-104C. PATCHING LARGE POROUS AREAS.
To patch large porous areas, proceed as follows:



High temperature resistant thread shall be used unless not available in supply. High temperature resistant thread does not propagate flame; nylon thread does.

NOTE

These procedures shall be performed at the Intermediate Level.

All patching shall extend a minimum of 1/2 inch beyond damaged areas. Patches may be overlapped to achieve a 1/2 inch margin.

Porous areas requiring patches larger than 7 inches by 7 inches shall render coveralls Non Ready For Issue (non-RFI). Maximum cut size of patches shall be 8 inches by 8 inches. All patches shall be cut one inch larger than area to be patched.

Zigzag stitching shall be single or double width of throw, 5 to 7 stitches per inch (measured on one side of row). Stitches will vary according to smoothness of tear.

Straight stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 5 to 7 stitches per inch with minimum backstitch or over-stitch of 1 inch. Stitching shall be 1/8 inch from raw edges unless otherwise specified.

Materials Required

Quantity	Description	Reference Number
1	Sewing Machine, Zigzag Single or Double Throw	—
As Required	Thread, Nylon High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-130-6245
	-or-	
	Thread, Nylon Size E, Type II Sage Green	V-T-295 NIIN 00-204-3884

Materials Required (Cont)

Quantity	Description	Reference Number
1	Sealer, Heat, Seam and Patch	MIL-S-85634
As Required	Heat Circle Patches, 2-Inch Diameter	NIIN 01-192-2489
As Required	Seam Tape, 1 1/2-Inch	NIIN 01-193-0469
	-or-	
	Seam Tape, 7/8-Inch	NIIN 01-189-6361
1	Roller, Hand	GGG-R-00620 NIIN 00-243-9401
1	Torque Wrench, 0 - 100 lb-in.	—
As Required	Cloth, Special	MIL-C-85637 NIIN 01-196-0076

1. Lay suit on flat surface, with the inside of the porous (white side) area facing up. With a china marker, mark a rectangular border around porous area.

2. Measure the dimensions of the porous border and, with a china marker, draw a duplicate shape on a new piece of Special Cloth. Add 1/2 inch to border of the repair piece and cut out the repair piece.

3. Place repair rectangle (green side down) on top of the porous area (white side up). Sew repair rectangle over porous rectangle with 1 row of stitches 1/4 inch from repair rectangle edges.

4. Turn suit right side out. Over the porous area, mark a new rectangle 1/4 inch inside reinforcement stitch line. Cut out the new rectangle along new marked line, being careful not to nick or cut the repair piece underneath.

NOTE

Patches shall not be within one inch of another patched area.

5. Turn coverall inside out. Apply tape to overlap both stitching and cut edges of repair rectangle and trimmed-out porous rectangle on the inside of the coverall per [paragraph 5-104](#).

NOTE

Patching over patches (meaning patching a patch) is not authorized.

6. [Perform leak test in accordance with paragraph 5-91.](#)

7. Document in accordance with OPNAVINST 4790.2 Series.

5-104D. REPLACEMENT OF ORIGINAL CONSTRUCTION SEAM TAPE. To replace original construction seam tape, proceed as follows:

NOTE

See [paragraph 5-116C](#), [step 3](#) for limitations.

Materials Required

Quantity	Description	Reference Number
1	Sewing Machine, Zigzag Single or Double Throw	—
As Required	Thread, Nylon High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-130-6245
	-or-	
	Thread, Nylon Size E, Type II Sage Green	V-T-295 NIIN 00-204-3884
1	Sealer, Heat, Seam and Patch	MIL-S-85634
As Required	Heat Circle Patches, 2-Inch Diameter	NIIN 01-192-2489
As Required	Seam Tape, 1 1/2-Inch	NIIN 01-193-0469
	-or-	
	Seam Tape, 7/8-Inch	NIIN 01-189-6361
1	Roller, Hand	GGG-R-00620 NIIN 00-243-9401
1	Torque Wrench, 0 - 100 lb-in.	—
As Required	Cloth, Special	MIL-C-85637 NIIN 01-196-0076

1. Using the heat sealer, heat the area and peel off the loose tape. Remove excess glue by scraping with a spatula or similar flat tool, without damaging the coveralls fabric. Continue the process for the length of the loose tape.

2. Center one layer of seam tape over the seam and apply tape in accordance with paragraph 5-104.

3. Perform leak test in accordance with paragraph 5-91.

4. Document in accordance with OPNAVINST 4790.2 Series.

5-104E. REPAIR OF LOOSE SEAM TAPE ATTACHING COMPONENTS TO COVERALL. To repair loose seam tape attaching neck seals, wrist seals, or socks, proceed as follows:

NOTE

Repairs are permissible only if the existing component remains intact. If the existing item is irreparably damaged, replace the component.

Materials Required

Quantity	Description	Reference Number
1	Sewing Machine, Zigzag Single or Double Throw	—
As Required	Thread, Nylon High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-130-6245
	-or-	
	Thread, Nylon Size E, Type II Sage Green	V-T-295 NIIN 00-204-3884

Materials Required (Cont)

Quantity	Description	Reference Number
1	Sealer, Heat, Seam and Patch	MIL-S-85634
As Required	Heat Circle Patches, 2-Inch Diameter	NIIN 01-192-2489
As Required	Seam Tape, 1 1/2-Inch	NIIN 01-193-0469
	-or-	
	Seam Tape, 7/8-Inch	NIIN 01-189-6361
1	Roller, Hand	GGG-R-00620 NIIN 00-243-9401
1	Torque Wrench, 0 - 100 lb-in.	—
As Required	Cloth, Special	MIL-C-85637 NIIN 01-196-0076

1. Trim loose seam tape from the point of separation.

2. Cut a new strip of seam tape and round the corners. Apply new strip of seam tape over the existing trimmed seam tape using the heat sealer in accordance with paragraph 5-104. Ensure that at least a 1/2-inch overlap exists between existing and new seam tape.

3. Perform leak check in accordance with paragraph 5-91.

4. Document in accordance with OPNAVINST 4790.2 Series.

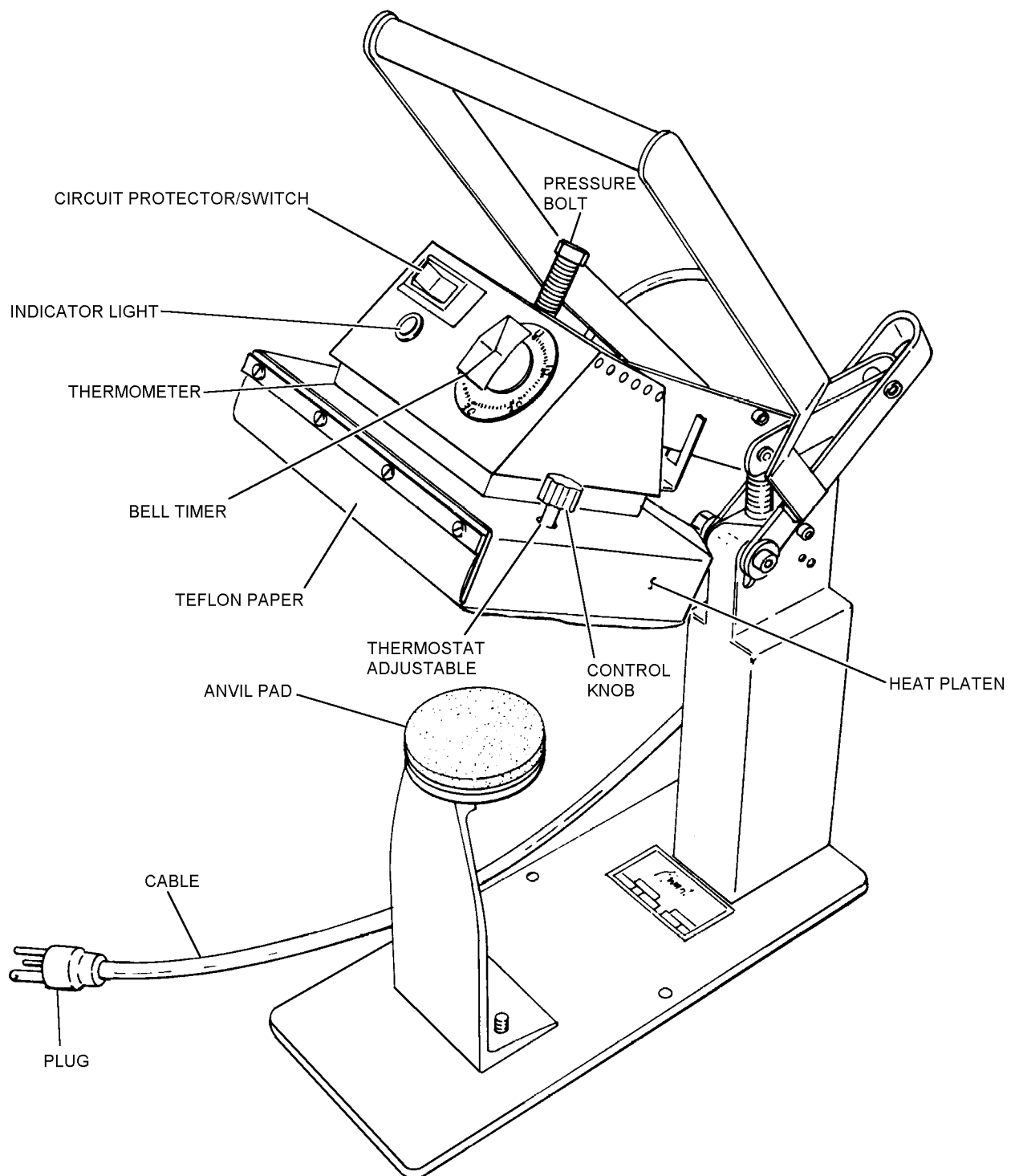


Figure 5-16. Heat Sealer, Seam and Patch

5-105. REPLACEMENT OF SRU-25/P OR CWU-75/P SOCKS. To remove and replace unserviceable socks, proceed as follows:

NOTE

For initial installation of SRU-25/P or CWU-75/P socks, refer to paragraph 5-73.

Materials Required

Quantity	Description	Reference Number
As Required	Tape, Seam, 1 1/2-Inch	NIIN 01-193-0469
	-or-	
	Tape, Seam, 7/8-Inch	NIIN 01-189-6361
As Required	Thread, Nylon, High Temperature Resistant, Sage Green	MIL-T-83193 NIIN 00-130-6245
	-or-	
	Thread, Nylon Size E, Type II Sage Green	V-T-295 NIIN 00-204-3884 or equivalent
1	Roller, Hand	GGG-R-00620 NIIN 00-243-9401
1	Pencil, China Marking	SS-P-196 or A-A-87
1	Chalk	SS-C-266

CAUTION

Do not mark coverall material with ball-point pen or lead pencil. Use only china marking pencil or tailor's chalk.

NOTE

Ensure coverall is right side out.

1. Remove old socks by cutting with scissors on stitch line.
2. Remove old seam tape from coverall leg by peeling tape off.

3. (A/P22P-6 Series only) Have aircrewmember don A/P22P-6 Series assembly (except hood, mittens and CWU-27/P), the appropriate PCU-Series torso harness, if applicable, proper size heavy wool socks and replacement SRU-25/P or CWU-75/P socks.

4. Mark coverall legs and socks (L and R) on inside and front and back to ensure socks are matched to correct leg during installation.

5. (A/P22P-6 Series only) Have aircrewmember sit in a straight-back chair with legs drawn back, heels directly below kneecaps and feet flat on floor.

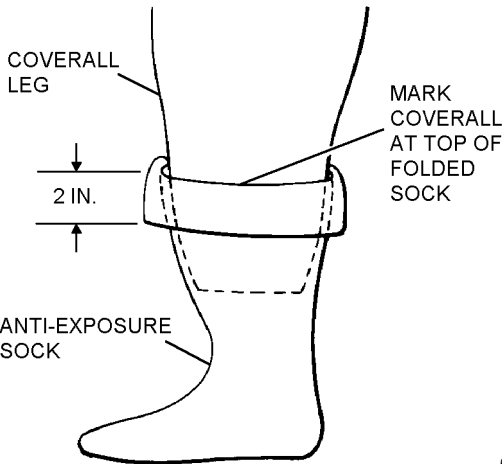
NOTE

If aircrewmember's leg length is such that a downward fold is provided in steps 6 through 9 (2-inch sock fold and 1-inch allowance beyond inseam mark) are not possible, refer to paragraph 5-113 for coverall leg extending instructions.

Removing top 2 inches of sock at initial installation is intended to ensure adequate coverall leg material remains for future sock replacements.

Ensure not to cut coverall too short.

6. Turn top 2 inches of sock down, forming a temporary cuff. Mark the circumference of coverall legs where they meet top of folded socks.



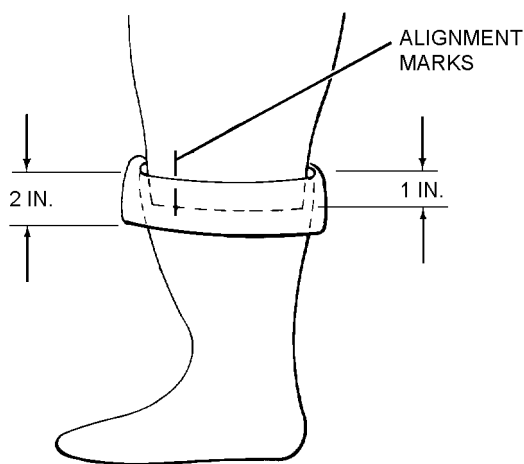
Step 6 - Para 5-105

5p105s6

7. (A/P22P-6 Series Only) Have aircrewmember doff socks and coveralls.

8. Remove top 2 inches of sock with a pair of sharp scissors.

9. Remove excess material from coverall leg by cutting a line 1 inch below the circumferential mark applied in [step 6](#). Ensure leg is cut perpendicular to lengthwise direction of leg. Make alignment marks at front of coverall leg and sock to ensure sock will be properly aligned with leg during attachment.



Step 9 - Para 5-105

5p105s9

10. Turn coverall inside out.

NOTE

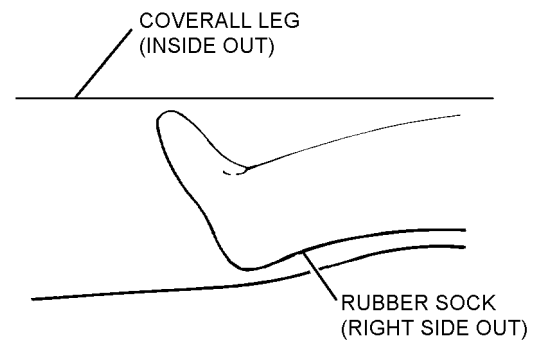
Due to slight differences in circumference of coverall leg and sock opening, it is recommended that alignment marks be added to both items before sewing. Make marks at front, back and both sides, equally spaced around circumference of both openings. It may be necessary to manually induce an uneven feeding of materials into sewing machine in order to compensate for differences in sock and coverall leg circumferences, thereby minimizing pleats or puckers.

11. Lay coverall out flat, face up.

NOTE

Ensure right sock is on right coverall leg and left sock is on left coverall leg.

12. Insert sock into leg opening, so that right sides of sock and coverall leg are facing each other.

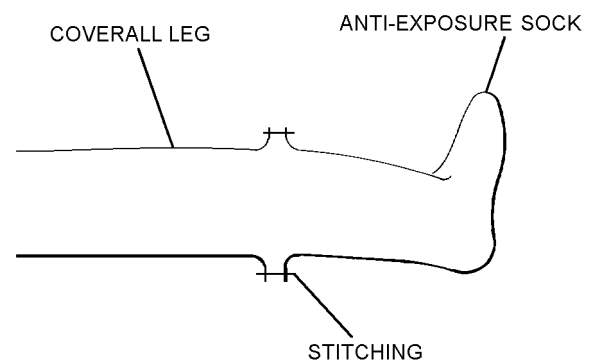


5p105s12

Step 12 - Para 5-105

13. Beginning at front of leg, with leg and sock alignment marks matched, attach sock with one row of stitches, 1/4 inch from cut edges, 5 to 7 stitches per inch, using nylon size E thread. Overlap stitching 1 inch. Do not backstitch. Minor pleats and puckers not affecting seam integrity are permissible. Satisfactory completion of required water test is final criteria coverall condition is RFI.

14. After removing suit from sewing machine, pull boot out through bottom of leg opening, exposing cut edges of seam.



5p105s14

Step 14 - Para 5-105

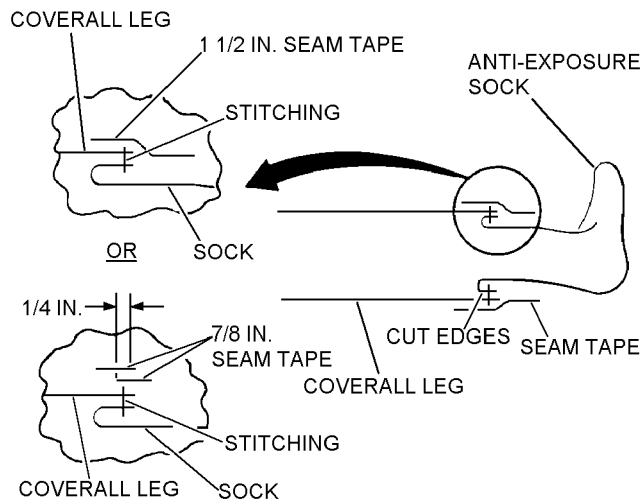
15. Fold cut edges of seam down over sock. Make fold as near stitch line as possible.

WARNING

Prior to application of seam tape, Aircrew Survival Equipmentman must be familiar with heat sealing machine operating procedures in NAVAIR 17-10DC-1. Refer to [paragraph 5-104](#) for application of seam tape.

Do not allow any coverall material threads or sewing machine thread to protrude from under seam tape.

16. Apply one layer of 1 1/2-inch seam tape to seam on inside, keeping stitch line and cut edges as nearly centered under tape as possible. Overlap ends of seam tape 1 inch.



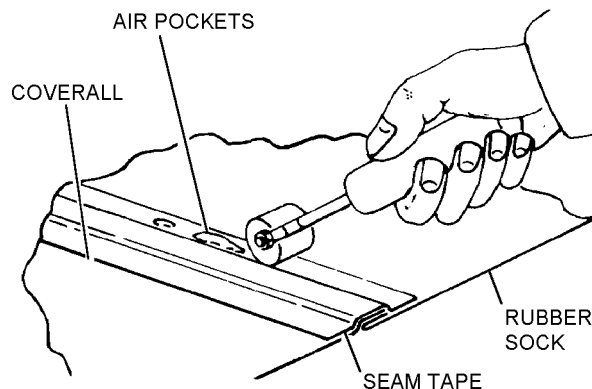
Step 16 - Para 5-105

NOTE

1 1/2-inch seam tape should be used when available.

If 7/8-inch seam tape is used, a second layer of seam tape may be applied, if necessary, to adequately cover stitching and cut edges of seam.

17. Immediately after lifting off heat sealer, remove air pockets with a hand roller by rolling along both sides of seam where air pocket occurs.



5p105s17

Step 17 - Para 5-105

18. Perform leak check in accordance with [paragraph 5-91](#).

19. Turn coverall right side out.

5-106. (A/P22P-6 SERIES ONLY) PRE-INSTALLATION INSPECTION OF REPLACEMENT NECK AND WRIST SEALS. Replacement neck and wrist seals for the CWU-62/P Series anti-exposure coverall is assigned a shelf life of three years. However, they may still be serviceable beyond the assigned expiration date. All neck seals (P/N 1725AS102-4) and wrist seals (P/Ns 1725AS101-1, 1725AS101-2, 1725AS101-3, and 1725AS101-4) may be installed regardless of expiration date only after passing the following inspection to determine their usability.

NOTE

Size 0 wrist seals can be obtained open purchase from FORMCO at 330-966-2111.

1. Inspect wrist seal in the following manner:

a. Visually inspect each wrist seal for cracking, especially at the open edges of the seal (i.e. top and bottom edges).

b. Lay wrist seal on its side and press out flat. Hold seal at top and bottom edges and stretch vertically. Inspect for cracks and deterioration. Repeat this procedure until the entire circumference of the seal has been inspected. If cracks or deterioration are identified, discard seal.

c. Lay wrist seal on its side and press out flat. Hold seal at its sides (folded edge) and stretch horizontally. Inspect for cracks and deterioration. Repeat this procedure until the entire surface of the seal has been inspected. If cracks or deterioration are identified, discard seal.

2. Inspect neck seal using procedures described in steps a through c above.

NOTE

The neck seal is molded into a bellows shape.

3. Neck and wrist seal shall be used only after passing the above inspection.

5-107. Deleted.

5-108. REPLACING CWU-62/P SERIES COVERALLS WRIST SEALS. To replace wrist seals, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Tape, Seam, 1 1/2-Inch	NIIN 01-193-0469
	-or-	
	Tape, Seam, 7/8-Inch	NIIN 01-189-6361
As Required	Thread, Nylon, High Temperature Resistant	MIL-T-83193 NIIN 00-130-6245
As Required	Adhesive, Polyurethane (Not)	UR-1092 NIIN 01-447-8206
1	Roller, Hand	GGG-R-00620 NIIN 00-243-9401
1	Pencil, China Marking	SS-P-196
1	Chalk	SS-C-266

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Methyl Ethyl Ketone	TT-M-261 NIIN 00-823-8052 NIIN 00-687-8429 or equivalent
As Required	Cloth, Cleaning Type II	MIL-C-85043 NIIN 00-045-9281
As Required	Emery Paper	—

Notes: 1. Adhesives may come from supply that contain both a base adhesive and an accelerator. Mixing of the accelerator with the base adhesive is not recommended for use on any items requiring adhesive in this manual. Use only the base adhesive.

NOTE

The cotton-flocked wrist seals, used on the CWU-62/P, are no longer being procured. Defective wrist seals may continue to be replaced with any cotton-flocked seals available locally. However, it is preferable to replace all wrist seals with the new CWU-62/P series coverall latex rubber seals (table 5-10). Once latex seals have been installed, the coverall should be redesignated as CWU-62A/P.

If latex wrist seals are being installed, the new wrist seals must be cleaned in accordance with step 6.

1. Before installing or replacing wrist seals on the CWU-62/P series coverall, inspect each seal in accordance with paragraph 5-106.

2. Select correct size wrist seal from table 5-10.

3. Remove old wrist seals by cutting with scissors along the bottom (closest to end of sleeve) stitch line.

4. Remove old seam tape from coverall sleeve by peeling the tape off (CWU-62A/P only).

5. Make four alignment marks equally spaced around circumference of both wrist seal and coverall sleeve opening.

NOTE

When attaching correct size wrist seal to arm opening of CWU-62/P series coverall, the dull side of seal should face toward the inside (next to the skin) and the shiny side should face out.

Table 5-10. Replacement Wrist Seals CWU-62/P Series

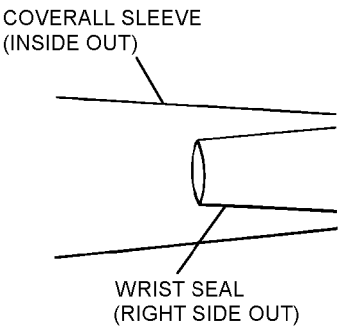
Government Part #	Size	Wrist Circumference	NIIN
1725AS101-1	1	Up to 6 1/2"	01-315-9428
1725AS101-2	2	6 1/2" - 6 3/4"	01-312-3144
1725AS101-3	3	6 7/8" - 7 1/8"	01-312-3145
1725AS101-4	4	7 1/4" - 7 5/8"	01-311-2831

6. Wipe surface of latex wrist seals using Methyl Ethyl Ketone (MEK) or acetone and cleaning cloth to remove all residue. Allow 15 to 30 seconds for MEK to “flash off”.

NOTE

Latex wrist seals must be clean for adhesive to hold to the latex.

7. With coverall sleeve turned inside out place new wrist seal, right side out, small end first, into sleeve opening.



Step 7 - Para 5-108

5p108s7

8. For CWU-62A/P, CWU-62B/P, and CWU-62C/P, align seal in coverall sleeve by matching marks. For CWU-62/P, position wrist seal construction seam adjacent to, but not directly over, sleeve construction seam.

NOTE

Circumference of wrist seal and sleeve opening may not be the same. When sewing wrist seal to coverall, it may be necessary to manually induce an uneven feeding of material to avoid pleats or puckers in seam. Pleats and puckers are not acceptable.

9. While ensuring cut edges are kept even, sew one row of stitches (5 to 7 stitches per inch) around circum-

ference of opening. Overlap stitching 1 inch. Do not backstitch. Make stitches 1/4 inch from cut edges.

NOTE

If aircrewmember’s arm length is such that proper location of the wrist seals is not possible or too much fabric has been removed in previous wrist seal replacements, refer to paragraph 5-114 for instructions for increasing sleeve length.

10. Prior to pulling wrist seal out of sleeve, trim loose ends 1/4 inch from sewn seam.

a. Pull wrist seal out of sleeve and insert a sleeve stiffener (plastic cup/cardboard tube locally manufactured) into sleeve to hold the sleeve end and wrist seal firmly in place.

b. Using emery paper (sandpaper), lightly scuff the surface of the wrist seal one inch from the seam.

c. Clean scuffed wrist seal with methyl ethyl ketone (MEK) and allow to dry for a minimum of five minutes.

11. Measure from the sewn edge toward the wrist seal outer edge one inch and mark circumference of the wrist seal using a grease pencil.

NOTE

Seam tape will not adhere properly to latex wrist seal without adhesive.

Do not use an accelerator (catalyst) with this adhesive.

Ensure the adhesive is not overage.

12. (CWU-62 Series) Apply adhesive to latex wrist seal as follows:

NOTE

Do not use masking tape to outline the one-inch mark. The polyurethane adhesive will stick to the masking tape and make clean removal of the masking tape impossible.

a. Apply a liberal coat of adhesive to the wrist seal surface between the trimmed edge and the grease pencil mark applied in step 11.

b. Allow 5 to 10 minutes for adhesive to dry, then apply a second liberal coat of adhesive to the wrist seal surface between the trimmed edge and the grease pencil mark applied in step 11.

NOTE

Application of heat seal tape (step 14) is time sensitive to step 12c.

c. Allow 15 minutes for second coat of adhesive to dry, then swab adhesive surface of latex wrist seal with a cloth dampened with MEK or acetone. Note time of completion.

NOTE

To achieve optimum tack, allow excess solvent to "flash off" for 15 to 30 seconds.

d. When aggressively tacky, fold sewn wrist seal section toward the wrist seal outer edge, joining the sewn edge of the wrist seal to the wrist seal by a single fold.

e. Using a hand roller, remove any folds or pleats from the wrist seam adhesive area to ensure a smooth finish.

13. Turn on the heat seal machine and adjust temperature on the heat seal platen to 300°F. Allow ten minutes for temperature to stabilize.

WARNING

Extended exposure to heat degrades adhesive.

NOTE

Both 1 1/2-inch and 7/8-inch heat seal tape are acceptable for heat sealing the wrist

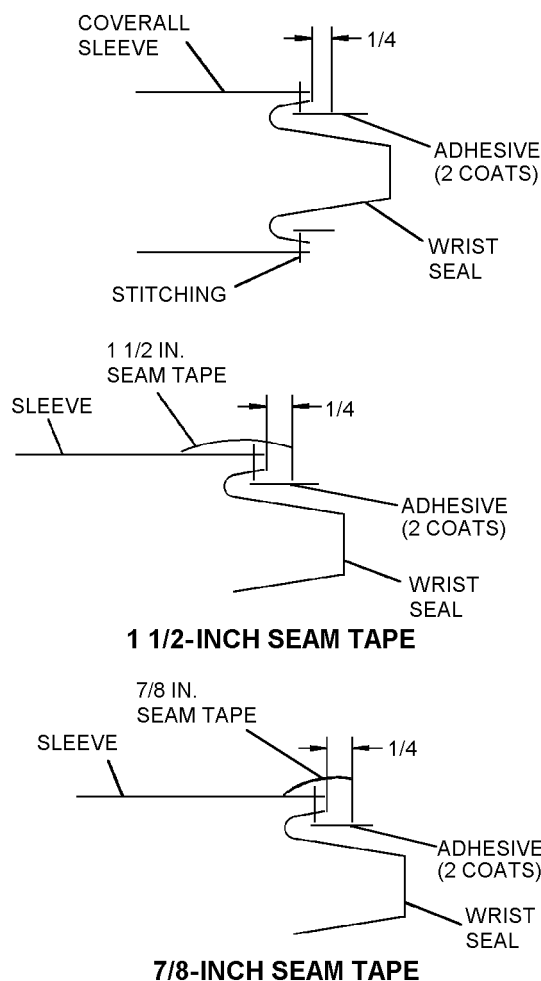
seal, however, the 1 1/2-inch tape is preferred. Only one layer of tape is to be used when sealing the seam regardless of tape size used.

14. One hour after completion of step 12c above, apply heat seal tape with the heat sealer machine temperature set at 300°F for a duration of 20 seconds per heat sealed section.

a. After heat platen is lifted from the fabric surface, press the fabric surface with the hand roller until surface temperature is approximately 100°F or body temperature.

b. Ensure there are no air pockets under the heat seal tape.

c. Tape shall extend 1/4 inch beyond cut edges of material. Overlap ends of seam tape 1 inch.



1 1/2-INCH SEAM TAPE

7/8-INCH SEAM TAPE

Steps 10 thru 14 - Para 5-108

5p108s10

15. Have aircrewmember don the coverall to assure wrist seals are located properly on the arms.

5-109. (A/P22P-6 SERIES ONLY) REPLACEMENT OF NECK SEAL. To replace the neck seal, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Tape, Seam, 1 1/2-Inch -or- Tape, Seam, 7/8-Inch	NIIN 01-193-0469 NIIN 01-189-6361
As Required	Thread Nylon, High Temperature Resistant -or- Thread, Nylon Size E, Type II Sage Green/Olive Drab	MIL-T-83193 NIIN 01-130-6245 V-T-295 NIIN 00-204-3884 or equivalent
As Required	Adhesive, Polyurethane (Not E2)	UR-1092 NIIN 01-447-8206
1	Roller, Hand	GGG-R-00620 NIIN 00-243-9401
1	Pencil, China Marking	SS-P-196
1	Chalk	SS-C-266
1	Neck Seal, Anti-Exposure (CWU-62A/P, CWU-62B/P, or CWU-62C/P only)	1725AS102-4 NIIN 01-312-3143 (Not E2)
As Required	Methyl Ethyl Ketone	TT-M-261 NIIN 00-823-8052 NIIN 00-687-8429 or equivalent
As Required	Emery Paper	—

Materials Required (Cont)

- Notes:
1. Adhesives may come from supply that contain both a base adhesive and an accelerator. Mixing of the accelerator with the base adhesive is not recommended for use on any items requiring adhesive in this manual. Use only the base adhesive.
 2. The cotton-flocked neck seals, used on the CWU-62/P, are no longer being procured. Defective neck seals may continue to be replaced with any cotton-flocked seals available locally. However, it is preferable to replace all neck seals with the new latex rubber seal. Once the latex seal has been installed, the coverall should be redesignated as CWU-62A/P, CWU-62B/P, or CWU-62C/P as applicable.

1. Before installing or replacing neck seal on the CWU-62/P Series coverall inspect each seal in accordance with paragraph 5-106.

NOTE

The neck seal will be difficult to lay flat due to the fact that the seal is molded into a bellow shape. If cracks or deterioration are identified discard seal. Neck seal shall be used only after passing inspection regardless of expiration date on package.

2. Remove as much as possible of seam tape covering neck seal to coverall seam by peeling the tape off.
3. Remove old neck seal by cutting and removing two rows attachment seam stitches being careful not to damage coverall fabric.
4. (CWU-62/P only) Select correct size replacement neck seal.
5. (CWU-62A/P, CWU-62B/P, or CWU-62C/P only) Select trim line on lower edge of seal corresponding to suit size (table 5-11) and trim along molded line.

NOTE

Due to slight differences in circumferences of neck seal and neck opening of coverall, alignment marks should be added to neck seal and to coverall fabric (for CWU-62/P series coveralls). Make alignment marks at center front, center back, and both sides equally spaced around circumference of neck seal. To aid in alignment, additional marks may be made between center front and each side, as well as between center back and each side to total 8 marks. CWU-62A/P, CWU-62B/P, and CWU-62C/P neck seal has alignment marks molded into it at center front, both sides and a double mark indicating the center back of seal. When attaching correct size neck seal to neck opening of coverall, the dull side of seal shall face toward the inside (next to the skin) and the shiny side should face out. It may be necessary to manually induce an uneven feeding of materials into sewing machine in order to compensate for differences in seal and coverall opening circumferences, thereby eliminating pleats and puckers in the material. Pleats and puckers are not acceptable.

6. Turn coverall inside out.

NOTE

Refer to latest revision of ASTM-D-6193 for seam types.

7. Attach seal using seam type LSq-2 (figure 5-17). First row of stitches shall be placed 3/8 inch from cut edge of fabric. Nomex thread is suggested due to the needle heating up as it passes through the rubber causing nylon threads to break. Otherwise the needle will need to be cooled while sewing.

**Table 5-11. Replacement Neck Seal
(CWU-62A/P, CWU-62B/P, or CWU-62C/P)**

Trim Line	Suit Size
1	1, 2, 3
2	4, 5, 6
3	7, 8, 9
4	10, 11, 12

Notes: 1. Trim line 1 is that closest to the upper neck opening and trim line 4 is that closest to the lower edge of the seal. These trim lines include seam allowance.

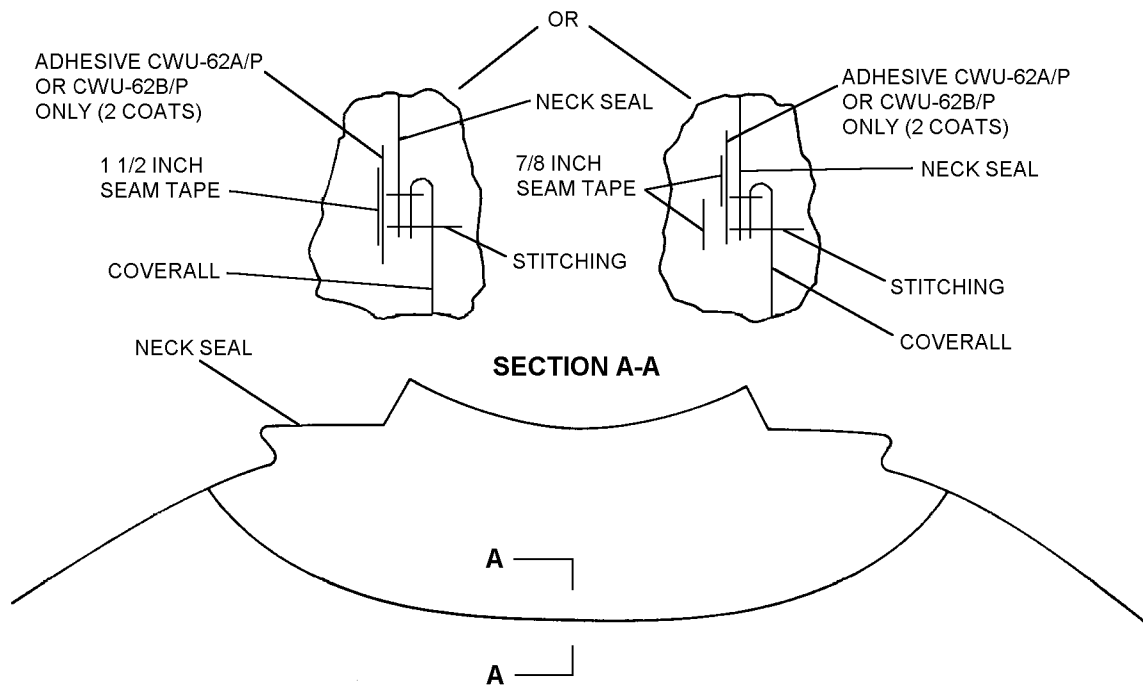


Figure 5-17. Attachment Seam (LSq-2), Neck Seal to Coverall

005017

NAVAIR 13-1-6.7-2

8. After folding coverall fabric back sharply over stitching, a second row of stitches shall be placed 1/4 inch from fold line.

9. Using emery paper (sandpaper), lightly scuff the surface of the neck seal one inch from the seam.

10. Clean surface of latex neck seal with MEK.

11. Measure from the sewn edge toward the neck seal outer edge one inch and mark circumference of the neck seal using a grease pencil.

NOTE

Seam tape will not adhere properly to latex neck seal without adhesive.

Do not use an accelerator (catalyst) with this adhesive.

Ensure the adhesive is not overage.

12. (CWU-62 Series) Apply adhesive to latex neck seal as follows:

NOTE

Do not use masking tape to outline the one-inch area of the neck seal to be scuffed. The polyurethane adhesive will stick to the masking tape and make clean removal of the masking tape impossible.

a. Apply a liberal coat of adhesive to the neck seal surface between the trimmed edge and the grease pencil mark applied in [step 11](#).

b. Allow 5 to 10 minutes for adhesive to dry, then apply a second liberal coat of adhesive to the

neck seal surface between the trimmed edge and the grease pencil mark applied in [step 11](#).

NOTE

Application of seam tape ([step 13](#)) is time sensitive to [step 12c](#).

c. Allow 15 minutes for second coat of adhesive to dry, then swab adhesive surface of latex neck seal with a cloth dampened with MEK. Note time of completion.

NOTE

To achieve optimum tack, allow excess solvent to “flash off” for 15 to 30 seconds.

d. When aggressively tacky, fold sewn neck seal section toward the neck seal outer edge, joining the sewn edge of the neck seal to the neck seal by a single fold.

e. Using a hand roller, remove any folds or pleats from the neck seam adhesive area to ensure a smooth finish.

NOTE

Do not begin next step until one hour has elapsed since completion of [step 12c](#).

13. Apply seam tape to inside of seam. If 7/8-inch seam tape is used, two layers of seam tape shall be applied in order that stitching and cut edges of material are overlapped a minimum of 1/4 inch ([figure 5-17](#)). Overlap ends of seam tape 1 inch. Tape shall extend 1/4 inch beyond folded edge of material.

5-110. Deleted

5-111. Deleted.

5-111A. Deleted.

5-112. Deleted.

5-113. (A/P22P-6 SERIES ONLY) INCREASING COVERALL LEG LENGTH. Increasing coverall leg length shall be accomplished for those individuals whose leg length does not allow adequate sock and coverall length allowances as stated in paragraph 5-73, Steps 4 through 7; or, when too much fabric has been removed during sock replacement. In these extreme cases, coverall legs shall be lengthened as follows:

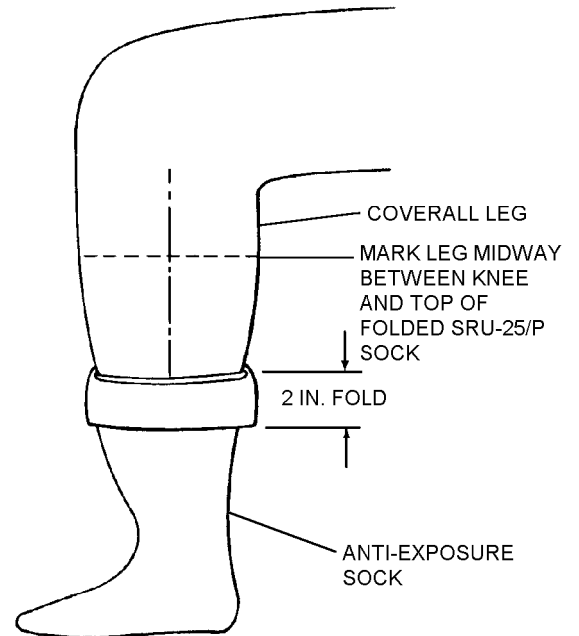
Materials Required

Quantity	Description	Reference Number
As Required	Cloth, Special	MIL-C-85637 NIIN 01-196-0076
As Required	Thread, Nylon, Green, Size E	V-T-295 NIIN 00-244-0609 or equivalent
1	Roller, Hand	GGG-R-00620
As Required	Tape, Seam, 1 1/2-Inch	NIIN 01-193-0469
	-or-	
	Tape, Seam, 7/8-Inch	NIIN 01-189-6361
As Required	Thread, Nylon, High Temperature Resistant	MIL-T-83193 NIIN 00-130-6245

1. Have aircrewmember don complete A/P22P-6 Series assembly including PCU-Series torso harness, if applicable, and proper size SRU-25/P or CWU-75/P socks.

2. Fold top 2 inches of sock down, forming a temporary cuff.

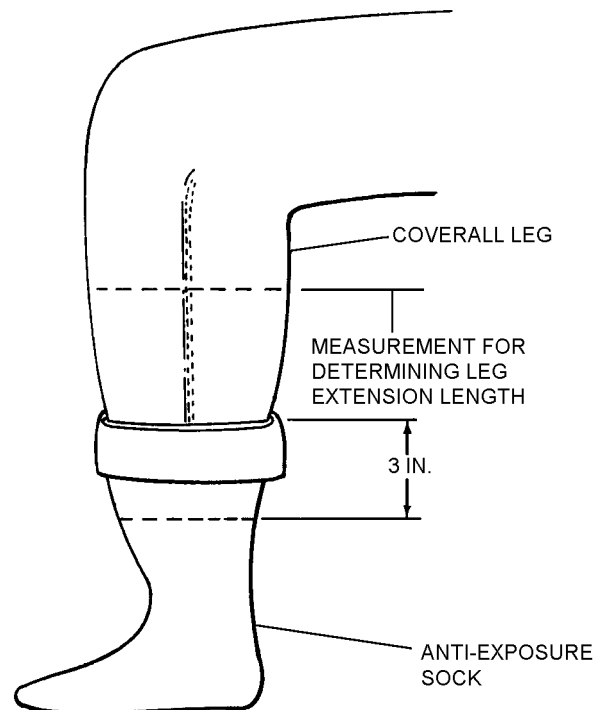
3. Mark inseam of coverall at a point midway between wearer's knee and top of folded sock.



5p113s3

Step 3 - Para 5-113

4. Measure from inseam midway mark to 3 inches below the sock's temporary fold line. This measurement will be used in cutting material for leg extension.



5p113s4

Step 4 - Para 5-113

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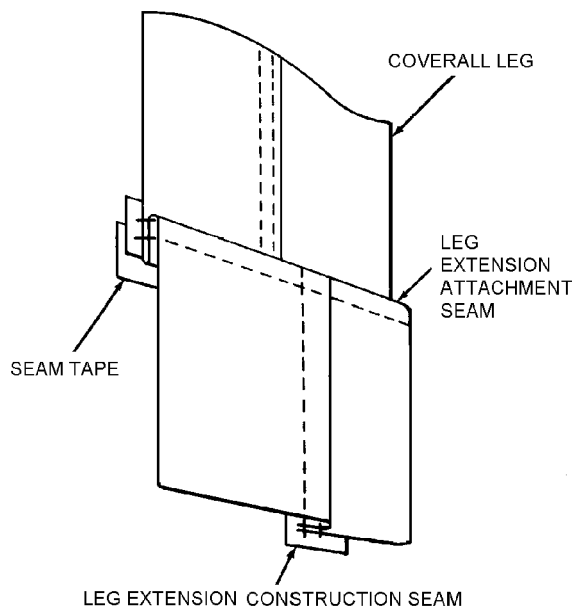
5. Have aircrewmember doff socks and coveralls. Cut coverall legs off at inseam mark, ensuring cut is made straight across leg.

6. Measure circumference of bottom of coverall leg, and add 3/4 inch to this measurement for seam allowance. This measurement is second dimension used in cutting material for extension.

7. Cut a rectangular piece of fabric using dimensions arrived at in steps 4 and 6. The step 4 measurement (leg length) shall be marked off parallel with selvage edge or warp thread direction of fabric. The step 6 measurement (leg circumference) shall be marked off in fill thread direction or perpendicular to selvage edge. This will ensure leg extension thread direction will coincide with coverall leg construction.

8. Join short sides of this material by folding in half (face to face) and sewing one row of stitches (5 to 7 stitches per inch), 1/4 inch from cut edges; then apply a row of top stitching, 1/4 inch from folded seam.

9. Attach extension to coverall leg with two rows of stitching, (LSq-2 seam) as shown. Place leg extension construction seam adjacent to, but not directly over, coverall leg inseam. Make first row of stitches 1/4 inch from cut edges, and top stitching 1/4 inch from folded seam. Stitching shall be 5 to 7 stitches per inch.



Step 9 - Para 5-113

5p113s9

10. Apply heat sealed seam tape to the inside of extension construction and attachment seams. If using 1 1/2-inch tape, use one layer; if using 7/8-inch tape, use two layers.

11. Refer to paragraph 5-73 for SRU-25/P or CWU-75/P sock attachment instructions.

12. After completing leg extensions, check for proper fit.

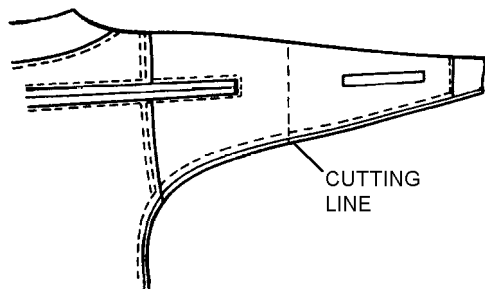
5-114. (A/P22P-6 SERIES ONLY) INCREASING COVERALL SLEEVE LENGTH. Increasing coverall sleeve length shall be accomplished for those individuals whose arm length does not allow adequate sleeve length allowances, or when too much fabric has been removed during wrist seal replacement. In these extreme cases, coverall sleeves shall be lengthened as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Cloth, Special	MIL-C-85637 NIIN 01-196-0076
As Required	Thread, High Temperature Nylon	MIL-T-83193 NIIN 00-130-6245
	-or-	
As Required	Thread, Nylon, Sage Green, Size E	V-T-295 NIIN 00-204-3884
	-or-	
	Thread, Nylon O.D. Type II CL A	NIIN 00-244-0609
1	Roller, Hand	GGG-R-00620 or Commercial
As Required	Tape, Seam, 1 1/2-Inch	NIIN 01-193-1469
	-or-	
	Tape, Seam, 7/8-Inch	NIIN 01-189-6361

1. After the coverall has been fit, and the need for sleeve extension has been determined, have the aircrewmember doff the coverall.

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2. (CWU-62/P and CWU-62A/P only) Mark sleeve underarm seam at a point midway between the end of the slide fastener and top of hook and pile tape.



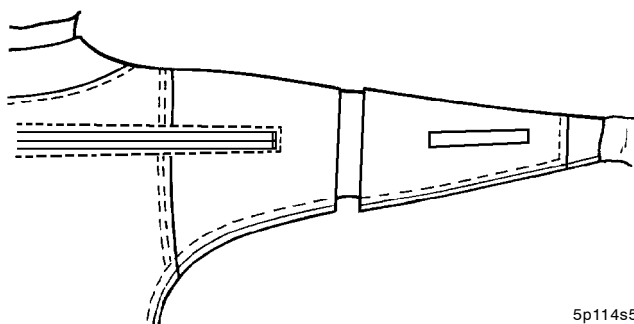
Step 2 - Para 5-114

5p114s2

3. (CWU-62B/P and CWU-62C/P only) Mark sleeve underneath seam at a point midway between the shoulder seam and the top of the wrist seal where it is attached to the fabric

4. Cut sleeve off at inseam mark, ensuring cut is made straight across sleeve.

5. Have aircrewmember don coverall and sleeve with arm extended to side. Measure widest point of gap between cut edges and add 1 inch to this measurement. This total measurement will be used in cutting material for sleeve extension.



Step 5 - Para 5-114

5p114s5

6. Have aircrewmember doff coverall and sleeves.

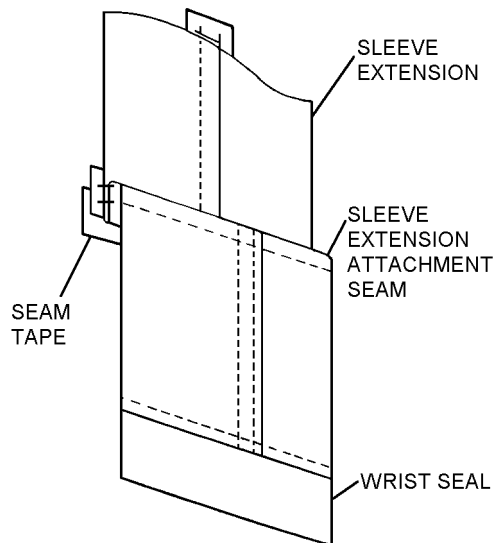
7. Measure circumference of cut edge of sleeve and add 3/4 inch to this measurement for seam

allowance. This measurement is second dimension used in cutting material for extension.

8. Cut a rectangular piece of fabric using dimensions arrived at in steps 5 and 7. The step 5 measurement (sleeve length) shall be marked off parallel with selvedge edge or wrap thread direction of fabric. The step 7 measurement (sleeve circumference) shall be marked off in fill thread direction or perpendicular to selvedge edge. This will ensure sleeve extension thread direction will coincide with coverall sleeve construction.

9. Join short sides of this material by folding in half (face to face) and sewing one row of stitches (8 to 10 stitches per inch), 1/4 inch from cut edges; then apply a row of top stitching, 1/4 inch from folded seam.

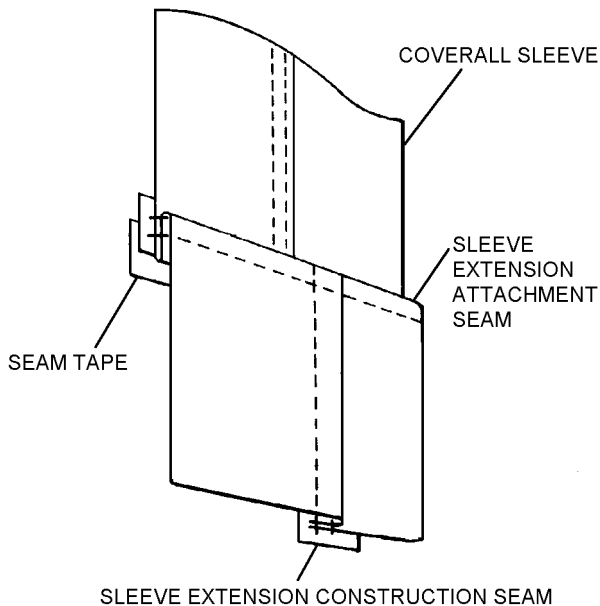
10. Attach extension to bottom half of sleeve with 2 rows of stitching, (LSq-2 seam) as shown. Place sleeve extension construction seam adjacent to, but not directly over sleeve underarm. Make first row of stitches 1/4 inch from cut edges, and top stitching 1/4 inch from folded seam. Stitching shall be 5 to 7 stitches per inch.



Step 10 - Para 5-114

5p114s10

11. Attach sleeve and extension to coverall as specified in [step 10](#).



Step 11 - Para 5-114

5p114s11

12. Apply heat sealed seam tape to the inside of extension construction and attachment seams. If using 1 1/2 inch tape, use one layer; if using 7/8 inch tape, use two layers.

13. After completing sleeve extensions, check for proper fit.

5-115. Deleted.

5-116. REPAIR OF CWU-62/P, CWU-79/P AND ARSD/MSD SERIES COVERALLS. Authorized patching shall be limited to the following:

NOTE

Total patched area shall not exceed 180 square inches.

5-116A. Definitions. The following definitions shall be used throughout this section to identify the various functions being performed.

NOTE

All patches shall be cut one inch larger than area to be patched and shall be sewn to the inside of the coverall (white side) with the green side of the patch facing out.

All edges and stitching shall be seam taped on the inside of the coverall.

1. Beyond Economical Repair (BER): That point at which a coverall would cost more to repair it than it would cost to replace it with a new coverall. This usually occurs when the coverall is reaching the end of its serviceable life but can also happen to newer coveralls that have been extensively damaged. Determination of BER should take into account the man-hours and materials that will be expended to repair the coverall. Although wage tables are not available for this calculation it is within the scope of the I-level technicians to use their judgement, experience and intuition when deciding how much repair is too much.

2. Patching: repairing a tear, rip, or hole by sewing a new piece of fabric or tape along the perimeters of the damage, then heat seal taping those sewn edges.

3. Porous Area: fabric that is visibly intact yet still leaks. During water test the criteria shall be: If one (1) drop of water falls from the underside of the coveralls in 10 seconds or less, the coverall shall be repaired. Coverall shall be repaired if during the air test a soap bubble forms twice in the same spot in 10 seconds or less.

4. Reinforcing: repairing a small tear, small rip, small hole or small porous area by heat seal tape alone.

5. Suit Panel: an individual section of the coverall, e.g., each sleeve, leg front, leg back, body (above crotch line and below neckline) front, or body back.

6. Original Construction Seam Tape: the original seam tape that was applied at the manufacturing plant in the construction of the coverall.

5-116B. Damage Dimensions. The following are various dimensions to be used throughout this section when determining damage that can and cannot be repaired.

1. Hole: Round damage or puncture; an entire circular or elliptical shape missing from the fabric.

a. Small: Pinhole; less than 1/16 inch diameter.

b. Large: Less than 3 inch diameter.

2. Nick/Gouge/Pit: Damage in neoprene layer of a wrist seal.

a. Must be less than 1/2 inch in length.

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3. Split/Crack: Linear damage at an edge through all layers of a wrist or neck seal.

a. Must be less than 1/2 inch in length.

4. Porous Area.

a. Small: Less than 1 inch diameter.

b. Large: Less than 7 inches by 7 inches. Patches over large porous areas cannot be within one inch of each other.

5. Rip: Linear damage; a long continuous cut with no other adjoining cuts.

a. Small: Up to 1 inch in length.

b. Large: Less than 10 inches in length.

6. Tear: "L" or "I" shaped damage; a long continuous cut with a short connected perpendicular cut at one or both ends.

a. Small: Up to a 1 inch long with 1/2 inch long cross-wise cut(s).

b. Large: Less than 7 inches in length with 1/2 inch long cross-wise cut(s).

5-116C. Individual Component Repair Limits.

The following are repair limits for the various components of the anti-exposure assembly.

1. Main suit panels:

a. May not have more than one large patched; tear, rip, hole or porous area.

b. May not have more than 25% of any panel area repaired by reinforcement and/or patching. This 25% being a cumulative total of previous and new repairs. This 25% calculation excludes original seam taping and reinforcement.

c. Any damage that intersects a seam is not repairable.

2. Socks:

a. May be replaced individually or in pairs.

b. Pinholes, small porous areas, small tear, small rip up to 25% area of sock.

3. Seam Tape: Original Construction.

NOTE

Replacement of the original construction seam tape (and subsequent repaired/replaced seam tape) shall be at the discretion of the I-level facility doing the repairs. The 15 continuous inches stated below shall be considered flexible to a certain degree. The integrity of the coverall is the most important factor in deciding how much seam tape to replace. I-level technicians must use their experience and intuition when deciding how much seam tape is safe to replace. If the technician feels that 15 continuous inches in a certain section of the coverall is too much to replace for safety reasons, then don't replace the tape and condemn the coverall. If on the other hand the technician needs to replace 15 and one half inches and feels that it is safe to do so, then replace the tape and return the suit RFI.

a. Original Construction Seam Tape: Repair only 15 continuous inches.

b. Repairs on seam tape attaching components to the coverall (e.g. anti-exposure socks) are permissible only if the existing item (attached components) remains intact. If component part is damaged remove seam tape and replace component.

Section 5-4. Commercial Non-Vented Wet Suit

5-117. GENERAL.

5-118. The wet suit assembly is an exposure protective assembly for continuous wear and will protect the aircrewmember from exposure to cold, water, wind, and spray resulting from emergency egress from an aircraft at sea. The wet suit, after being modified to the procedures in this section, will incorporate a ventilation system which is used in conjunction with a conditioned or ambient air source.

5-119. CONFIGURATION.

NOTE

Due to the wide variety of commercially obtained wet suits that have been made available, it would be impossible to cover every known suit in existence. Two of the most basic and common configurations are shown in figure 5-18 and 5-19.

5-120. Single or two-piece wet suits are available in four basic sizes. See table 5-12.

5-121. SUPPLEMENTARY EQUIPMENT.

5-122. UNDERWEAR. Wear only aramid underwear, CWU-43/P Drawers and CWU-44/P Undershirt.

5-123. ANTI-EXPOSURE MITTENS AND HOOD. If applicable, refer to sections 3-27A for mittens and 3-17A for hood.

5-124. APPLICATION.

5-125. When authorized by the cognizant Type Commander, the modified commercial wet suit is worn by aircrewmember for flight operations where climatic conditions warrant. The commercial non-vented wet suit shall be worn by an aircrewmember for flight operations in accordance with the climatic and operational requirements established by the NATOPS General Flight and Operational Instructions Manual OPNAVINST 3710.7 Series.

5-126. MAINTENANCE.

5-127. Maintenance operations shall be performed by organizational level or above. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

5-128. SERVICE LIFE. The commercial wet suit shall remain in service until it is beyond economical authorized repair or until directed to remove from service by this manual.

5-129. PREFLIGHT INSPECTION. The Preflight Inspection shall be performed by the aircrewmember prior to each flight and shall consist of the following:

Table 5-12. Basic Sizing Chart

	Small	Medium	Large	Extra Large
Chest	35 - 37	37 - 40	40 - 42	42 - 45
Waist	29 - 33	32 - 35	34 - 37	37 - 41
Weight	130 - 155	150 - 180	170 - 200	200 - 235
Height	64 - 168	67 - 72	70 - 74	72 - 76
Dimensions in inches; weight in pounds				

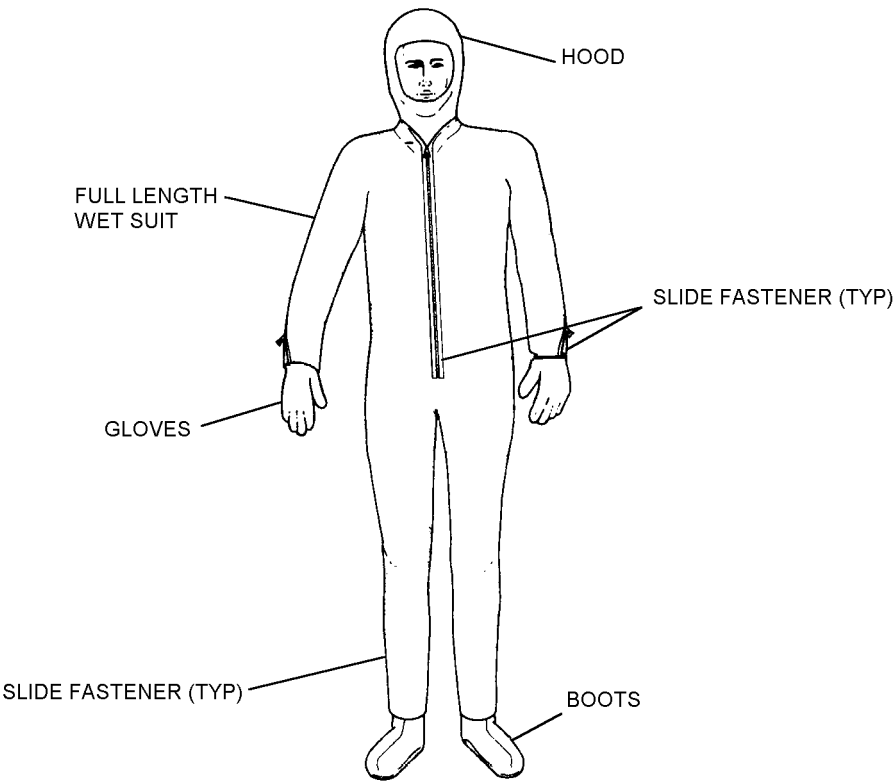


Figure 5-18. Full-Length Wet Suit

5-18

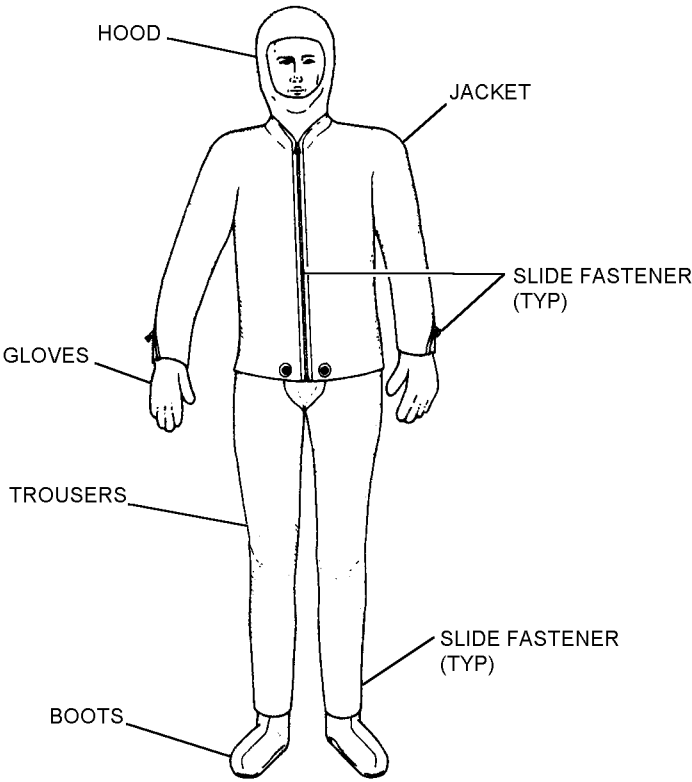


Figure 5-19. Two-Piece Wet Suit

5-19

1. Assembly for cuts, tear, abrasions, and deteriorations.
2. Seams for separation, stitching, cuts, and tears.
3. Inspect for corrosion and proper operation of the entrance, sleeve and leg slide fasteners.
4. Vent air inlet port (if installed) for corrosion and security of fittings.
5. Inspect hook and pile tape (if installed) for security of attachment.

5-130. If any discrepancy is noted, return to Aviator's Equipment Branch for a periodic inspection.

5-131. POSTFLIGHT MAINTENANCE. This maintenance may be performed by the aircrewmember. After each use, hang wet suit on a wooden hanger in a position allowing legs and arms to hang free of obstruction in a cool, dry, and well-ventilated area.

5-132. SPECIAL INSPECTION. The Special Inspection shall be performed by organizational level or above upon issue prior to placing the wet suit in service and every 90 days thereafter. The Special Inspection shall also be performed prior to placing the assembly in storage and when removed from storage. Only authorized repairs shall be made. To perform the Special Inspection proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Lubricant Stick	Zipperease NIIN 00-999-7548

1. Assembly for cuts, tears, abrasions, and deterioration.
2. Seams for separation, stitching, cuts, and tears.
3. Entrance, sleeve, and leg slide fasteners for proper operation and corrosion (if applicable and if needed). Apply coating of lubricant using lubricant stick to slide fastener chains.
4. Inspect vent air fitting (if installed) for corrosion. Inspect fitting for looseness by grasping and jerking.
5. Inspect hook and pile tape (if installed) for security of attachment.

6. If discrepancies are noted, wet suit shall be repaired.

7. The wet suit shall be cleaned by the aircrewmember in accordance with paragraph 5-133.

5-133. CLEANING. To clean the wet suit, proceed as follows:

1. To clean assembly, shower washing with mild soap is recommended.



Do not wring; do not damage ventilation ducts.

2. To dry assembly, hang on a wooden hanger in a position allowing legs and arms to hang free of obstruction in a cool, dry, and well-ventilated area.

5-134. STORAGE. When storing the wet suit, proceed as follows:



Sufficient quantity of cellulosic material conforming to PPP-C-843, Type II, Class A or B must be inserted at folds to prevent cracking.

1. All slide fasteners (if applicable) shall be in fully closed position.

2. Hang wet suit on a wooden hanger in a position allowing legs and arms to hang free of obstruction in a cool, dry, and well-ventilated area.

5-135. REPAIRS/FABRICATIONS/INSTALLATIONS

Instructions for performing authorized repairs, fabrications, or installations to maintain the wet suit in a Ready For Issue (RFI) condition can be found in the following paragraphs. Only the repairs/fabrication/installations listed in table 5-13 are authorized.

5-136. Repairing Holes, Tears, and Surface Cracking. To repair holes, tears, and cracks, apply a small amount of neoprene adhesive to the torn edges, allow 10-minute tack-time, and butt edges together. Surface cracking can be repaired by applying cement to affected areas.

5-137. Replacing Entrance Leg and Sleeve Slide Fasteners. To replace slide fasteners, proceed as follows:

1. Remove fasteners pile tape carefully with a small amount of solvent, if necessary, to prevent severe tearing of foam material.

2. Cut stitches of old slide fastener and remove.



Do not stretch material as it feeds through machine or slide fastener will not finish at the desired point.

3. Sew in new slide fastener.

4. Replace fastener pile tape (if applicable).

5-138. Recementing Loose Pile Tape. Use standard cementing procedures to recement loose pile tape.

5-139. INSTALLATION OF VENTILATION SYSTEM FOR COMMERCIAL NONVENTED WET SUITS. To install ventilation system on commercially procured, full-length, or two-piece nonvented suits, proceed as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Cloth, Coated and Laminated (19 oz/yd ²) Type I, Color: Orange	MIL-C-23926
As Required	Trilok Spacer Material	Style 6009-1-1 (CAGE 02934)

Materials Required (Cont)

Quantity	Description	Reference Number
1	Vent Inlet Port (Red)	MS17969-2
2 1/2 Inch Dia. Patch	Cloth, Coated, Neoprene (7.0-7.9 oz/yd ²) Color: SG/BLK	MIL-C-19002
As Required	Toluene	TT-T-548
As Required	Adhesive, Neoprene Color: Neutral	P/N 1041 NIIN 00-440-5603 (CAGE 31711)
	-or-	
As Required	Adhesive, Polychloroprene (Not E1)	MIL-A-5540
As Required (Not E1)	Fastener, Hook, Type II, 2-Inch Wide Nylon, Black	MIL-F-21840
As Required (Not E1)	Fastener, Pile, 2-Inch Wide Nylon, Black	MIL-F-21840
1	Revolving Head Cutting Punch	MIL-P-2001

- Notes:
- 1. Adhesives may come from supply that contain both a base adhesive and an accelerator. Mixing of the accelerator with the base adhesive is not recommended for use on any items requiring adhesive in this manual. Use only the base adhesive.
 - 2. Required only for installation in two-piece wet suits.

Table 5-13. Authorized Repairs/Fabrications/Installations

Description of Repair/Fabrication/Installation	Application	Paragraph
Repairing Holes, Tears, and Surface Cracking	All wet suits (when applicable)	5-136
Replacing Entrance, Leg, and Sleeve Slide Fasteners	All wet suits (if and when applicable)	5-137
Recementing Loose Pile Tape	All wet suits (when applicable)	5-138
Installation of Ventilation System	All commercial nonvented wet suits when authorized by the cognizant Type Commander	5-139
Recementing Ventilation Ducts and Seam Tapes	All wet suits (when applicable)	5-140

NOTE

Acquire a thorough understanding of all fabrication and installation instructions prior to initiating any actions. The dimensions given may be modified slightly to accommodate various style garments.

The following procedures are divided up into two steps. [Step 1](#) is for full-length wet suits and [step 2](#) is for the two-piece suits.

1. Full-Length Wet Suits.

a. Turn the wet suit garment inside out and place the back side of the wet suit facing upward.

b. Mark the location on the wet suit for the vent inlet port. See [figure 5-20](#).

NOTE

Cut panel 4 so it will completely cover the vent inlet port reinforcing patch and will also overlap panel 3 by 1/2 inch.

c. Cut the ventilation duct panel pieces 1, 2, 3, and 4. Place panels on the wet suit and mark their location. See [figure 5-21](#).

WARNING

Do not use toluene near open flames, heat, or electrical sparks. Avoid prolonged contact with skin or breathing of fumes. Use only in a well-ventilated area.

CAUTION

Toluene may damage equipment if not used with care. Avoid all contact with areas not to be cleaned. Wipe up excess or spills immediately.

NOTE

Do not touch cleaned areas when handling.

Store adhesive in air-tight containers.

NOTE

When separating two cemented surfaces, always brush seams with toluene. Prevent toluene from soaking into fabric areas not to be cemented. Remove residue cement with terry cloth, stiff bristle brush (not wire), or soft circular brush driven by an electric or compressed air drill. Remove only top two layers of adhesive as coverall fabric absorbs first coat of adhesive when recementing.

d. Clean material to be cemented with toluene. Allow to thoroughly dry.

e. Mix equal amounts of toluene and adhesive.

f. Apply two coats of neoprene adhesive to 2 1/2-inch diameter vent inlet port reinforcing patch and five coats of adhesive to wet suit where vent inlet port is to be located. Allow 10 to 30 minutes between each coat of adhesive.

g. When last coat of adhesive becomes tacky, place reinforcing patch on wet suit.

h. Punch a 1 1/8-inch diameter hole through center of reinforcing patch and wet suit material.

i. Install vent inlet port.

j. Prepare wet suit for the installation of ventilation duct panels by cleaning material to be cemented with toluene. Allow to thoroughly dry.

k. Mix equal amounts of toluene and adhesive.

NOTE

The Trilok spacer material used for the horizontal ventilation duct (Panel 2) should be cut on the bias.

l. Cement 1-inch wide strips of Trilok spacer materials to the wet suit using two coats of neoprene adhesive; allow 10 to 30 minutes between each coat. Cement spacer material to wet suit only every 4 inches (approx.) for a distance of 1/2 inch. See [figure 5-21](#).

m. Cement Panel 2 and Panel 4 to wet suit first.

n. Cement Panel 1 and Panel 3 to wet suit. Begin cementing these panels to wet suit where they overlap Panel 2.

o. Using revolving head cutting punch, punch two 1/16-inch diameter holes every 3 inches along total length of ventilation duct system.

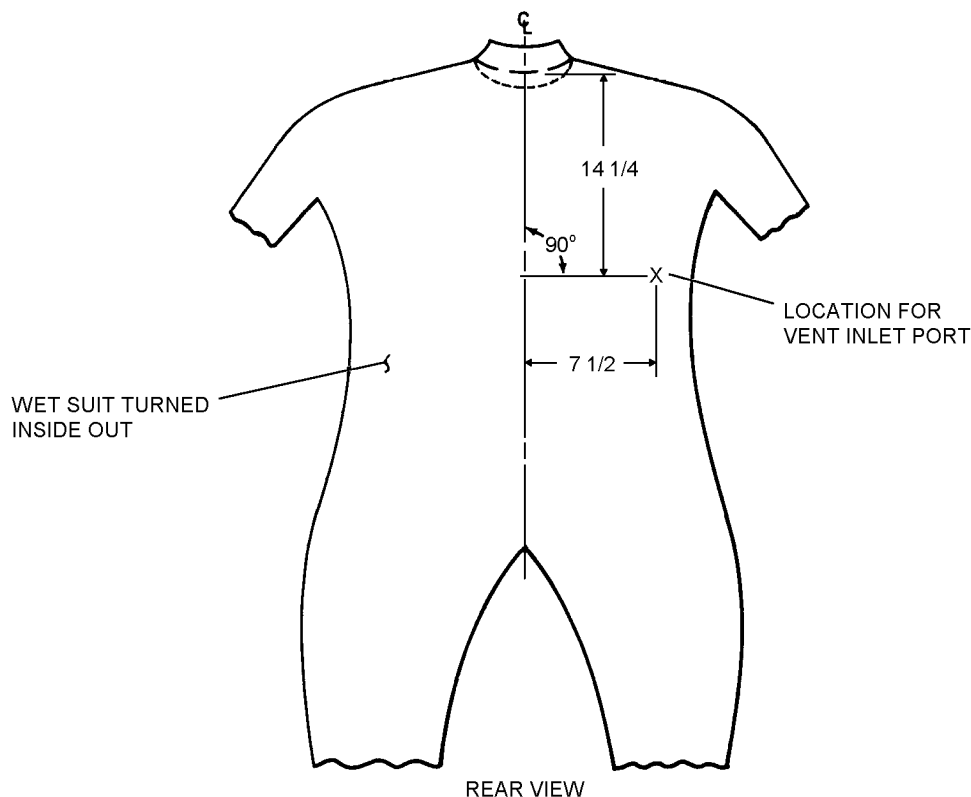


Figure 5-20. Vent Inlet Port Position (Suit)

5-20

NOTE

Allow 24 hours for adhesive to completely cure before suit is donned.

2. Two-Piece Wet Suits.

NOTE

The ventilation system is installed in the pants portion only on two-piece suits.

a. Turn wet suit pants inside out, and place back side of wet suit facing upward.

b. Mark location on wet suit pants for vent inlet port. See [figure 5-22](#).

c. Cut ventilation duct panel pieces 1, 2, 3, and 4. Place panels on pants portion of wet suit, and mark their location. Panel 1 and 3 should be shortened so that they end approximately 1/2-inch from top edge of pants. See [figure 5-23](#).

WARNING

Do not use toluene near open flames, heat or electrical sparks. Avoid prolonged contact with skin or breathing of fumes. Use only in a well-ventilated area.

CAUTION

Toluene may damage equipment if not used with care. Avoid all contact with areas not to be cleaned. Wipe up excess or spills immediately.

NOTE

Do not touch cleaned areas when handling.

Store adhesive in air-tight containers.

When separating two cemented surfaces, always brush seams with toluene. Prevent toluene from soaking into fabric areas not to be cemented. Remove residue cement with terry cloth, stiff bristle brush (not wire), or soft circular brush driven by an electric or compressed air drill. Remove only top two layers of adhesive as coverall fabric absorbs first coat of adhesive when recementing.

d. Clean material to be cemented with toluene. Allow to thoroughly dry.

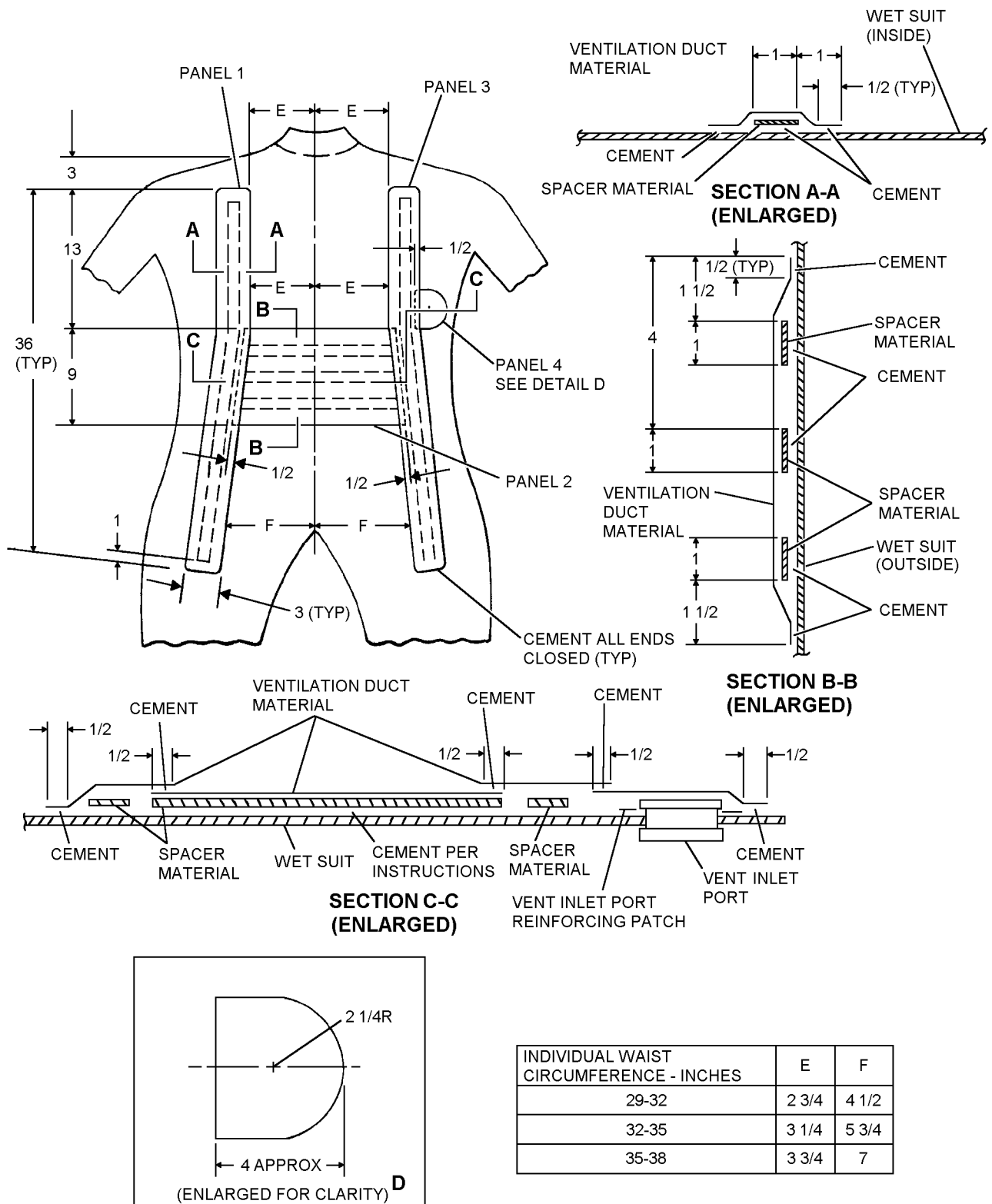


Figure 5-21. Ventilation Duct Panel Position (Suit)

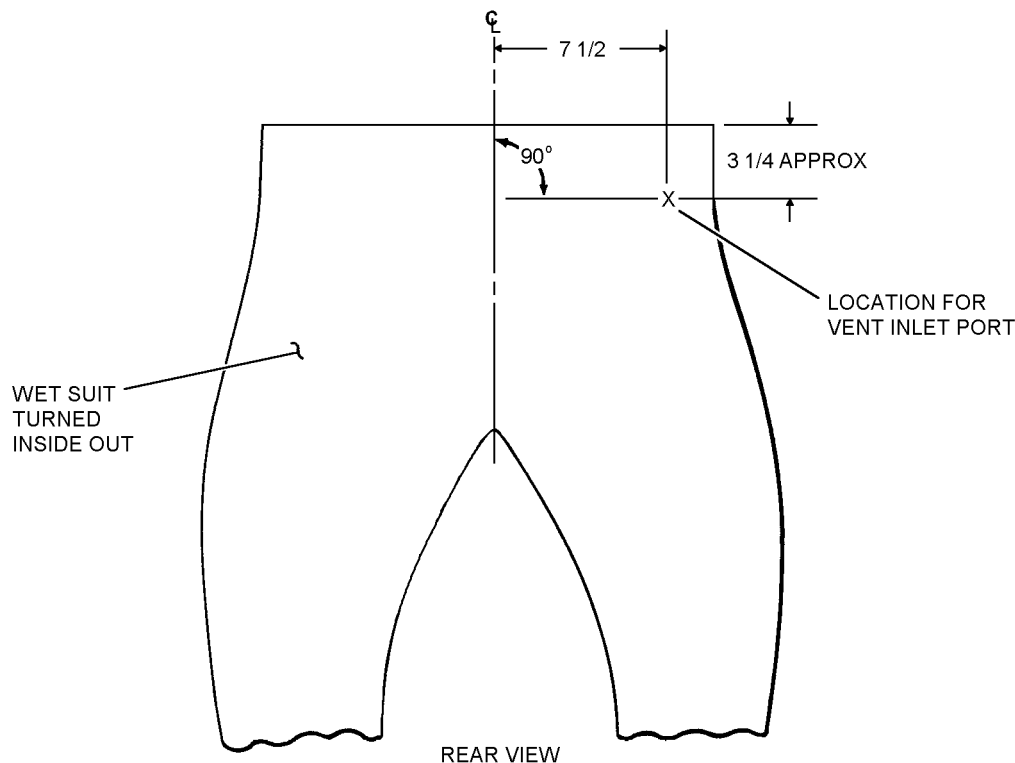


Figure 5-22. Vent Inlet Port Position (Pants)

5-22

e. Mix equal amounts of toluene and adhesive.

f. Apply two coats of neoprene adhesive to 2 1/2-inch diameter vent inlet port reinforcing patch and five coats of adhesive to wet suit where vent inlet port is to be located. Allow 10 to 30 minutes between each coat of adhesive.

g. When last coat of adhesive becomes tacky, place the reinforcing patch on wet suit.

h. Punch a 1 1/8-inch diameter hole through center of reinforcing patch and wet suit material.

i. Install vent inlet port.

j. After turning wet suit pants right-side out, don pants and jacket.

k. Mark the location of vent inlet port on jacket. Punch 1/8-inch diameter hole through jacket so that hole will line up with vent inlet port installed on pants. A ring of hook and pile fastener tape approximately 1-inch wide may be sewn around vent port and opening on jacket to secure jacket and pants together in this area.

l. Remove jacket and pants and turn pants inside out. Prepare wet suit pants for installation of ventilation duct panels by cleaning material to be cemented with toluene. Allow to thoroughly dry.

m. Mix equal amounts of toluene and adhesive.

NOTE

The Trilok spacer material used for the horizontal ventilation duct (Panel 2) should be cut on the bias.

n. Cement 1 inch wide strips of Trilok spacer material to wet suit using two coats of neoprene adhesive; allow 10 to 30 minutes between each coat. Cement spacer material to wet suit only every 4 inches (approx.) for distance of 1/2 inch. See [figure 5-23](#).

o. Cement Panel 2 and Panel 4 to wet suit first.

p. Cement Panel 1 and Panel 3 to wet suit. Begin cementing these panels to wet suit where they overlap Panel 2.

q. Using a revolving head cutting punch, punch two 1/16-inch diameter holes every 3 inches along total length of the ventilation duct system. Ensure that holes are punched at top of Panels 1 and 3 so that ventilation air will flow into jacket.

5-140. Recementing Ventilation Ducts and Seam Tapes. Use standard cementing procedures. Ensure ends of seam tapes overlap a minimum of 1/2 inch.

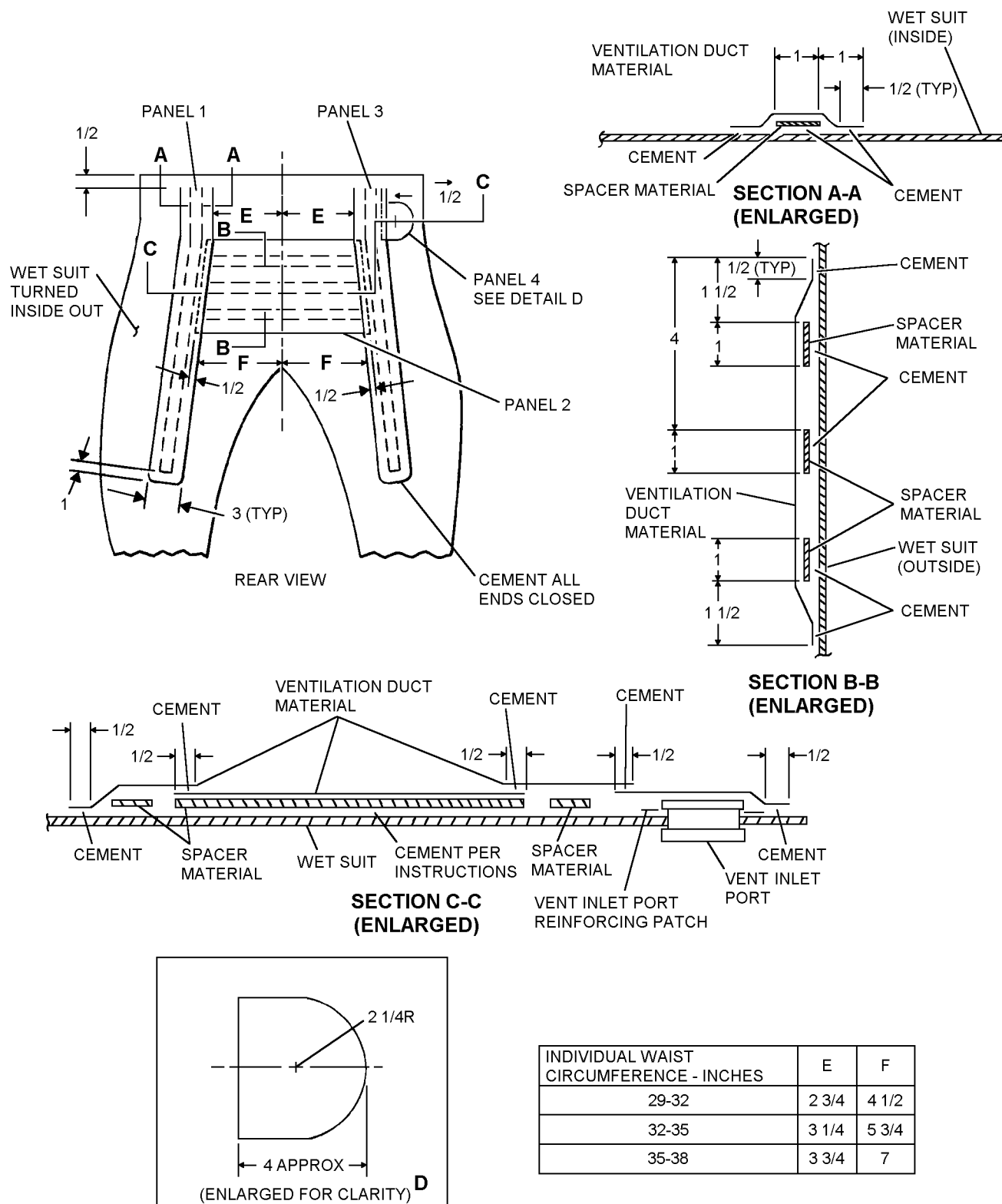


Figure 5-23. Ventilation Duct Panel Position (Pants)

Section 5-5. A/P22P-7(V) Quick Donning Flyer’s
Anti-Exposure Apparel Assembly CWU-60/P

5-141. GENERAL.

5-142. The A/P22P-7(V) Quick Donning Anti-Exposure Apparel Assembly is an emergency use assembly designed to keep the wearer warm and dry. The complete assembly provides protection from the thermal effects of cold water immersion in the event of emergency over water aircraft egress.

5-143. CONFIGURATION.

5-144. The A/P22P-7(V) Quick Donning Anti-Exposure Apparel Assembly consists of the components shown in figure 5-14 and is available through the TYCOM’s direction only. P/N 1510AS102-1, NIIN 01-277-2899, consists of the CWU-60/P coverall and the stowage bag that the coverall is stored in. The coverall only is P/N 1510AS103-1 (no NIIN assigned for the coveralls only).

5-145. UNDERCLOTHING. Wear CWU-43/P and CWU-44/P aramid cold weather underwear. Refer to chapter 3 for detailed descriptions and sizing information for underwear.

5-146. CWU-45/P JACKET AND CWU-18/P TROUSERS. The CWU-45/P jacket and CWU-18/P trousers provide thermal insulation for winter flights over land and over water and can be worn under the CWU-60/P coverall in an emergency. Refer to chapter 3 for detailed descriptions of these items. The

CWU-64/P cold weather flyer’s coverall is a one-piece lined coverall and is an authorized alternative to these two garments for winter flights. Refer to chapter 3 for a detailed description of this item.

5-147. CWU-60/P QUICK DONNING ANTI-EXPOSURE COVERALLS. Refer to figure 5-24. The CWU-60/P is a one piece coverall constructed of a gas expanded, closed cell neoprene foam body, mittens, boots, face seal, an aramid laminated microporous poly tetrafluoroethylene (PTFE) hood, and neoprene coated cotton gloves. These neoprene gloves are located adjacent to the mittens and provide dexterity when needed. The outside of the coverall also has removable reflective tape to aid in search and rescue operations. Two types of reflective tape are provided: fluorescent red-orange for maximum daytime detection and bright silver for maximum nighttime detection. The tape provides passive detection and enables the aircrewmember to remove the reflective tape if evasion is desired. The coverall also includes ankle and waist straps and an entrance slide fastener which extends from the crotch up the center front. The suit also features a recovery harness which includes a D-ring providing the capability for helicopter pick up in case the survival vest is not being worn at the time of rescue. A pocket located on the right thigh of the coverall contains the HGU-32/P anti-exposure hood. CWU-60/P are maintained in the ALSS bond rooms and are available only through the TYCOM.

Table 5-14. Components of the A/P22P-7(V) Assembly

Component	Nomenclature	Paragraph
CWU-43/P	Drawers	5-145
CWU-44/P	Undershirt	5-145
CWU-45/P	Cold Weather Flyer’s Jacket	5-146
CWU-18/P	Cold Weather Trousers	5-146
CWU-60/P	Quick Donning Anti-Exposure Coverall	5-147
CWU-21/P22P-7(V)	Survival Vest	5-148
LPU-27/P22P-7(V)	Life Preserver	5-149
HGU-32/P (optional)	Anti-Exposure Hood	5-150
HGU-68(V)2/P	Helmet	5-151

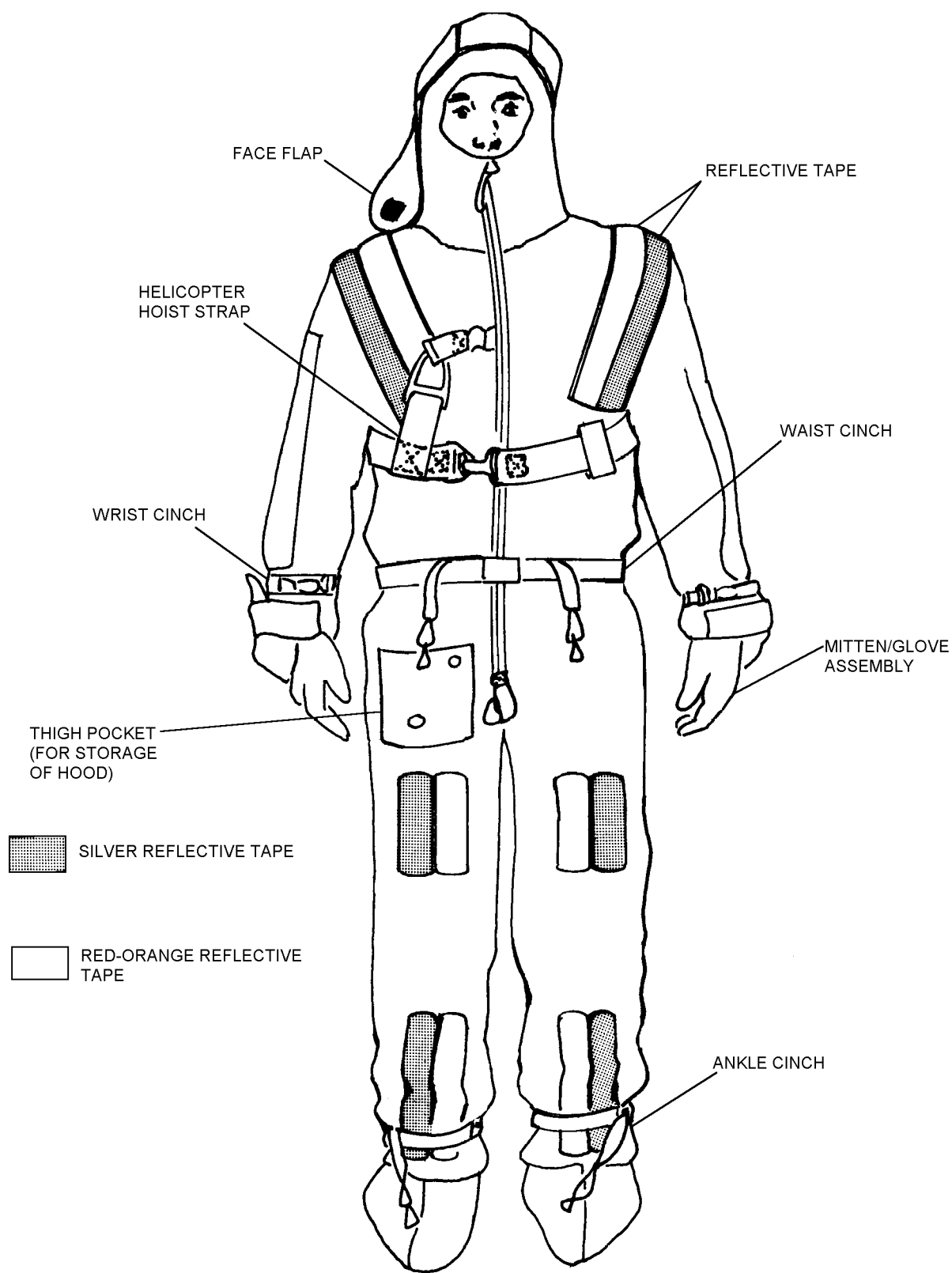


Figure 5-24. CWU-60/P Quick Donning Anti-Exposure Coverall

5-24

5-148. CMU-21/P22P-7(V) MODIFIED SURVIVAL VEST. The CMU-21/P22P-7(V) survival vest provides maximum useful storage for survival equipment, consistent with minimal bulk and weight. It is identical to the SV-2 survival vest, but has the addition of an expansion panel for use over the CWU-60/P.

5-149. LPU-27/P22P-7(V) LIFE PRESERVER UNIT. The LPU-27/P22P-7(V) is identical to the LPU-21B/P life preserver but has the addition of an expansion panel for use over the CWU-60/P. It is integrated with the CMU-21/P22P-7(V) in order to provide flotation for in-water survival situations. Refer to NAVAIR 13-1-6.1-2 for a detailed description of the LPU-27 life preserver.

5-150. HGU-32/P ANTI-EXPOSURE HOOD (OPTIONAL). The HGU-32/P hood is stowed in the thigh pocket of the CWU-60/P coverall. It is to be used whenever the helmet is removed during a cold water survival situation. Refer to Section 3-17A for a detailed description of the HGU-32/P hood.

5-151. HGU-68(V)2/P HELMET. The HGU-68(V)2/P helmet is worn by aircrew personnel of P-3 aircraft. The helmets are worn with the anti-exposure assembly and over the hood of the CWU-60/P coverall. Refer to NAVAIR 13-1-6.7-3 for detailed descriptions of the helmets.

NOTE

C-130 aircrews are not required to wear helmets.

5-152. APPLICATION.

5-153. The A/P22P-7(V) assembly is designed to provide a minimum of 6 hours of thermal protection against hypothermia and enough buoyancy to keep a downed aircrewman afloat should he be unable to board a liferaft. The CWU-60/P component is not worn continuously, but is stowed onboard the P-3 and C-130 aircraft for emergency use. In general, the coverall will be used by aircrewmembers in an emergency in accordance with climatic and operational requirements as established by NATOPS General Flight and Operational Instructions Manual (OPNAV-INST 3710.7 Series).

5-154. FITTING AND DONNING.

5-155. FITTING. The CWU-60/P coverall is available in one size only but is adjusted to fit through use of ankle, wrist and waist straps to help maintain the proper fit and reduce the bulk. The other components of the assembly are fitted in accordance with procedures specified in their respective sections.

5-156. DONNING THE CWU-60/P COVERALL. To don the CWU-60/P coverall proceed as follows:

- 1. Remove your survival vest/life preserver unit and helmet, if applicable.
- 2. Insert feet into the coverall legs and cinch the ankle straps.
- 3. Pull the suit up and insert your arms into the sleeves. The hands should enter the glove side of the glove/mitten configuration. Cinch the wrist straps. Ensure hood is outside of coverall.
- 4. Close the entrance slide fastener, utilizing the thumb loop provided in the crotch/groin area. Pull down on the suit's crotch thumb loop, while pulling up on the slide fastener.
- 5. Cinch the waist straps and connect the helo-hoist strap.
- 6. Put your survival vest/life preserver on utilizing the extension panels provided if necessary. Secure survival vest leg straps.

NOTE

The CWU-60/P is worn over all flight clothing, including boots, but under the life preserver and survival vest.

5-157. MODIFICATIONS.

5-158. See Table 5-14A for applicable directives. Refer to Table 5-15 for repairs and fabrications to maintain serviceability.

Table 5-14A. CWU-60/P Directives

Description of Modification	Application	Modification Code
Installation of Face Shield Repair Fabric	CWU-60/P Coveralls	67-1007 and 67-1007 AM 1

5-159. MAINTENANCE.

5-160. Maintenance of the CWU-60/P coverall shall consist of inspection, leakage testing, storage, repair, cleaning, and packing. All maintenance and repair operations shall be performed by Aircrew Survival Equipmentmen. All maintenance actions shall be documented in accordance with OPNAVINST 4790.2 Series.

NOTE

Inspections shall be performed during the aircraft's inspection cycle designated in Planned Maintenance Systems publications for the aircraft to which assigned.

In no case shall the inspection interval of inservice coveralls exceed 224 days, whether the coveralls are aircraft installed, shop spares or maintained in a flight gear pool.

5-161. PLACE-IN-SERVICE INSPECTION OF THE CWU-60/P COVERALL. The inspection shall be performed at intermediate level. To perform an inspection examine for the following:

1. Assembly for cuts, tears, abrasions, and deteriorations.
2. Seams for broken or loose stitching, seam separations and loose or damaged seam tapes.
3. Entrance slide fastener for proper operation and corrosion.
4. All hook and pile tape for damage and security.
5. Recovery harness for frayed webbing, deformed or missing hardware and security of attachment.
6. Inspect waist, wrist and ankle cinches for frayed straps and deformed or missing hardware.
7. Inspect all hardware for damage, wear, corrosion, and security of attachment.
8. Inspect for damaged or missing reflective tape patches.

9. Inflatable hood for cuts, tears, abrasion, deterioration, and proper attachment.

10. Conduct a leak test in accordance with [Section 5-8](#).

11. Stowage bag for broken stitching, tears, abrasion, holes, illegible printed data, and damaged/broken snaps.

12. Reinforce the hood face shield in accordance with [paragraph 5-174A](#).

13. Conduct a leak test in accordance with [paragraph 5-165](#).

5-162. SPECIAL INSPECTION. The Special Inspection shall be performed by intermediate level or above prior to stowing the CWU-60/P onboard the aircraft and at the aircraft inspection cycle (every 224 days) thereafter. Only authorized repairs shall be made. To perform the Special Inspection proceed as follows:

NOTE

Refer to [Section 5-8](#) for inspection, cleaning and repair of the hood.

1. If required, clean the CWU-60/P in accordance with [paragraph 5-166](#).

2. Conduct a Place-In-Service Inspection of the CWU-60/P coveralls in accordance with [paragraph 5-161](#).

3. Repair the CWU-60/P, if required, in accordance with [paragraph 5-168](#). Repair other components of the assembly as detailed in their specific sections.

4. Attach inflatable hood using 60-inch length of Type I nylon cord, seared at both ends.

a. Tie one end to hood eyelet using approximate 2-inch loop and a bowline knot.

b. Tie other end of nylon cord to coverall at top pocket small hole using approximate 3-inch loop and bowline knot.

5. Document maintenance actions in accordance with OPNAVINST 4790.2 Series.

5-163. LEAKAGE TEST.

NOTE

The leak test will be performed by an Aircrew Survival Equipmentman at the intermediate level.

5-164. Test Fixture. Test fixture, P/N 1936AS100-1, shall be procured through the TYCOM.

NOTE

Commercially available petroleum jelly may be used on the threaded pipe to prevent leakage around the nut, gasket, and washer.

5-165. Test Procedure. To test the CWU-60/P Quick Donning Anti-Exposure Coverall for leakage, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Test Fixture	See Para 5-164
As Required	Leak Tec Solution	MIL-L-25567 NIIN 00-621-1820

1. Loosen all straps.

2. Place test fixture inside suit at center of hood opening, with lower plate resting on inside of back of hood.

3. Loosen locking nut to allow upper portion of test fixture to be raised above the lower plate assembly. Pull slide fastener closed with the slider tight against the top stops. Lay the facial area opening of the suit flat against the lower plate assembly with the slider and pull tab as close to the center threaded rod as possible. See figure 5-28.

4. Tuck slide fastener tab inside Lower Plate Rubber Channel. Close the face flap over the facial area. Use extreme care to avoid folds or creases in the sealing area. Lower the upper plate assembly of the test fixture and tighten nut to compress the facial opening and slide fastener between the top and bottom plate assemblies. See figure 5-29.

NOTE

Assure green cloth portion of hood is not caught between the rubber pads of the upper and lower plates.

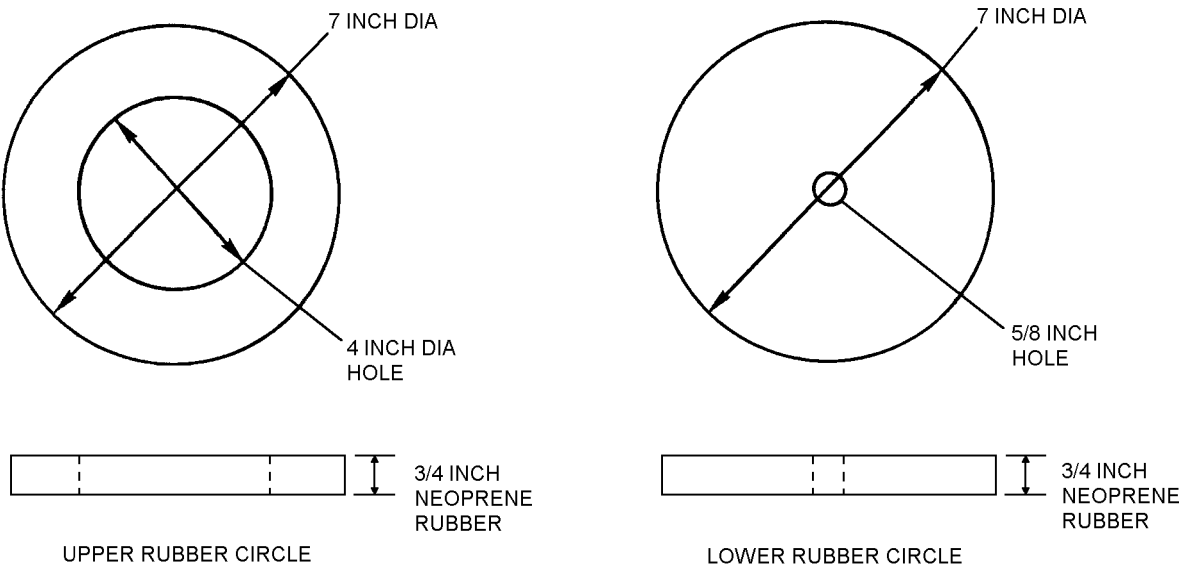


Figure 5-25. Rubber Circle Dimensions

005025

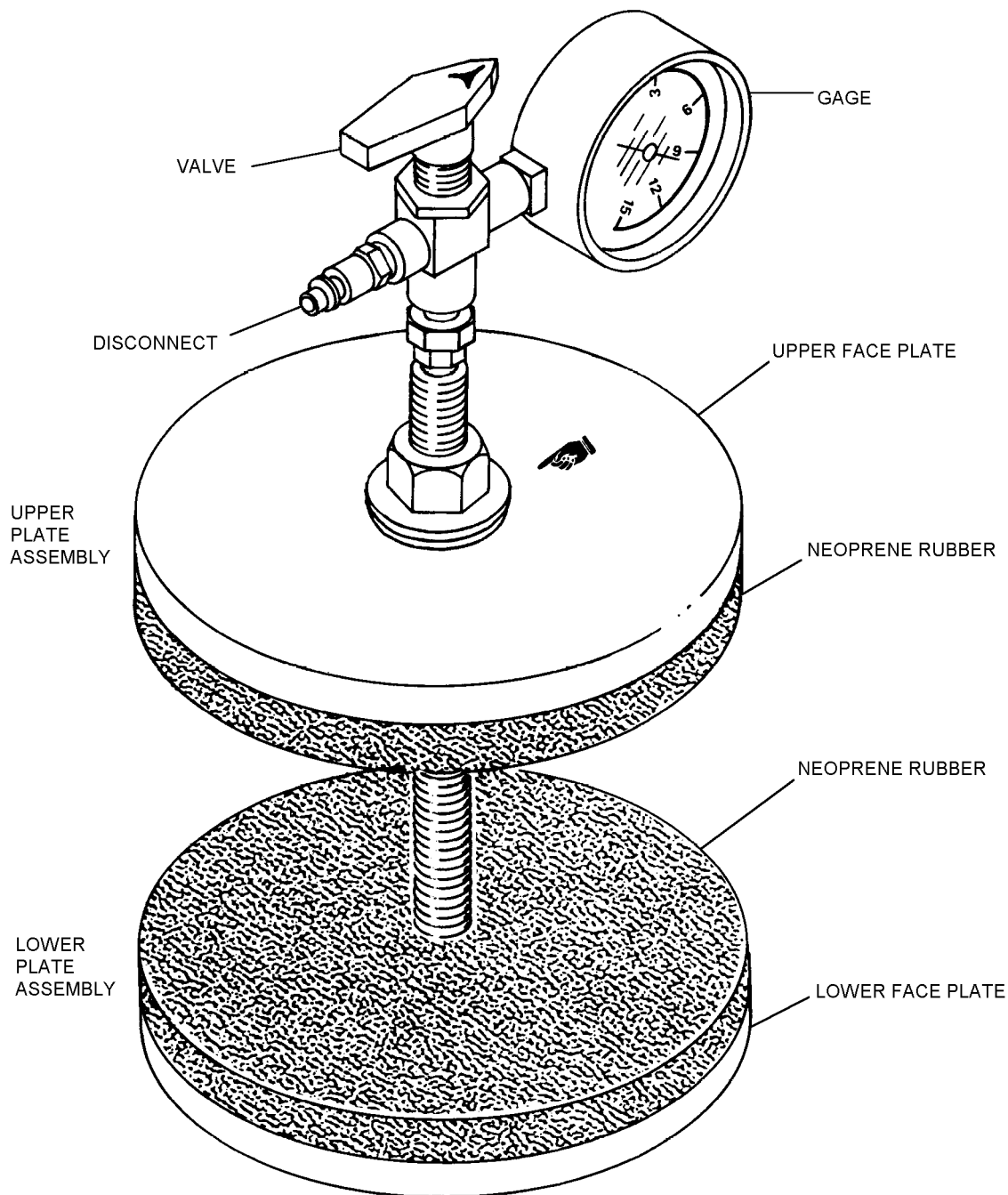


Figure 5-26. Leak Test Fixture (Assembled)

005026

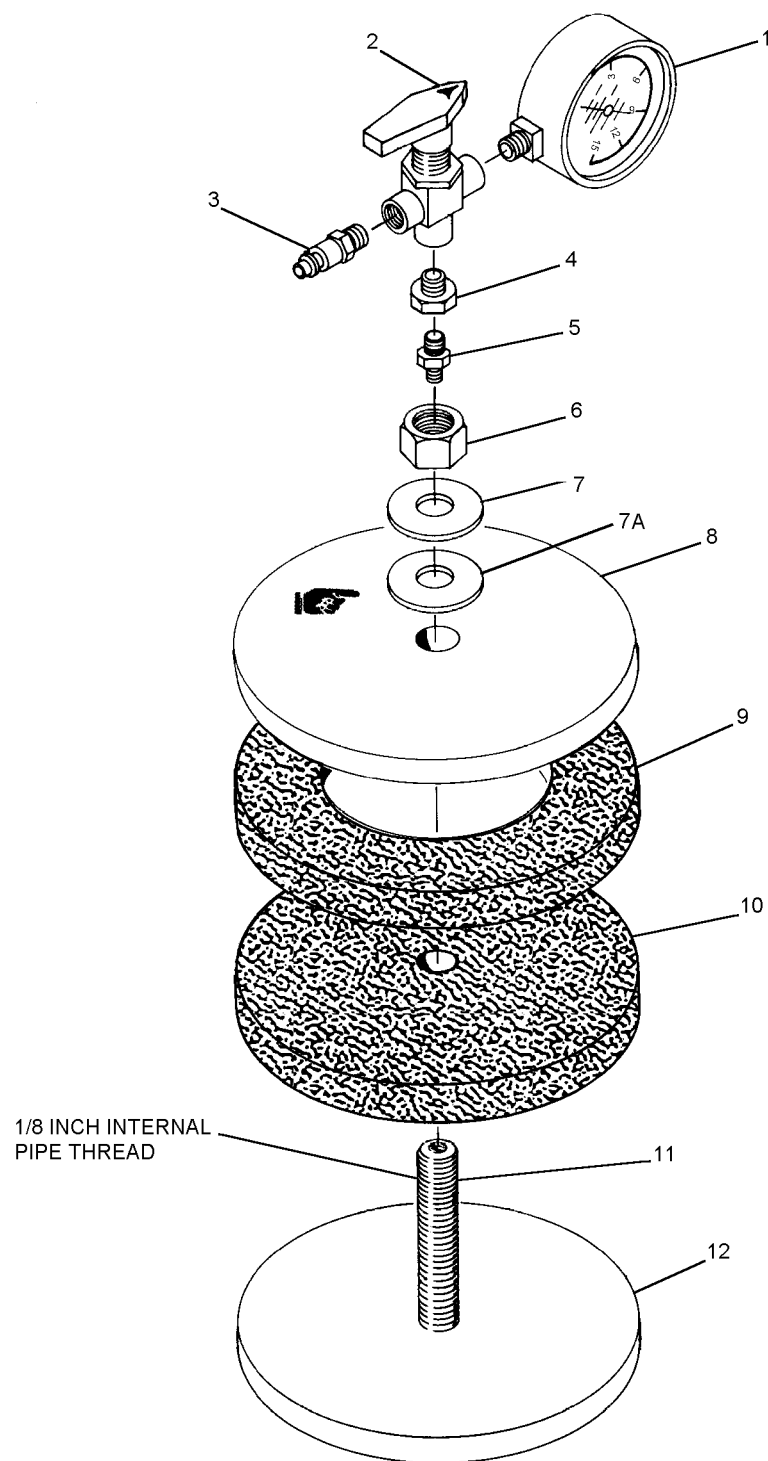


Figure 5-27. Leak Test Fixture

005027

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
5-27	1936AS100-1	LEAK TEST FIXTURE	1	
-1	00-187-3143 or 00-919-3784	GAGE, Water Press., 0-15 Inches, 2 1/2 Inch Dial	1	
-2	B43XVF4	VALVE, 3-Way With Vent (12623)	1	
-3	MIL-C-4109	COUPLING, Air Hose (Male)	1	
-4	00-186-3024	BUSHING, Pipe Reducer	1	
-5	AN911-1J	NIPPLE, Pipe	1	
-6	MS51967-20	NUT, Hex, 5/8 Inch 11-UNC-2B	1	
-7	MS51412-12	WASHER	1	
-7A	—	GASKET, Rubber, 1 5/8 Inch Outer Diameter, 1/2 Inch Inner Diameter (Note)	1	
-8	QQ-A-250/11	PLATE, 1/2 Inch x 7 Inch, Aluminum	1	
-9	7X.750-20-1	CIRCLE, Rubber, 3/4 Inch x 7 Inch, 4-Inch Center (76385)	1	
-10	7X.750-20-2	CIRCLE, Rubber, 3/4 Inch x 7 Inch, 5/8 Inch Center (76385)	1	
-11	98790A035	ROD, Steel, Threaded, 5/8 Inch, Hollow	1	
-12	QQ-A-250/11	PLATE, 1/2 Inch x 7 Inch, Aluminum	1	
	Notes: 1. Replacement for rubber gasket is locally manufactured of solid rubber (NSN 9230-00-241-9746). To manufacture replacement gasket, use a 1/2 inch punch, cutting, double bow (NSN 5110-00-180-0932) for the inner diameter and 1 5/8 inch punch, cutting, double bow (NSN 5110-00-540-5786) for the outside diameter.			



Assure pointer on 3-way valve is pointing toward gage when connecting air source.

5. Connect a dry, filtered, clean low pressure air source to the test fixture at the male quick disconnect fitting. Rotate the black pointer on the 3-way valve toward the air inlet and inflate the coverall for no more than 20 seconds. Rotate the black pointer in the direction of the gage to check the pressure in the coverall. (See figure 5-29.) If the pressure is below six inches of water, turn pointer back toward air inlet letting in a small amount of air. If pressure is above six inches of water, turn the pointer to the bleed hole in the 3-way valve to bleed excessive pressure down to six inches of water. Check gage reading after 15 seconds. Leave pointer facing gage and observe gage for pressure drop. If gage pressure has dropped, tighten down nut on top plate.

6. If pressure continues to drop, apply Leak Tec solution around the outer edge of upper plate assem-

bly and slide fastener. If a leak is present, deflate suit following steps 8 and 9 below and repeat steps 1 through 5. When confident that a good seal between test fixture and suit is made and pressure has been stabilized at 6 inches water pressure, leave suit at pressure for 5 minutes.

7. If pressure reading drops below 5 inches of water pressure during the 5 minute test period, check for leaks and structural damage over the entire outer surface area of the coverall with leak detection solution or soapy water. Mark any leak area.

8. Disconnect air source. Rotate pointer toward air inlet to release pressure in suit, loosen nut to dump pressure.

9. Remove faceplate assembly. Rotate pointer arrow toward gage to return gage reading to zero.

10. Allow suit to dry.

11. Repair if required in accordance with paragraph 5-168.

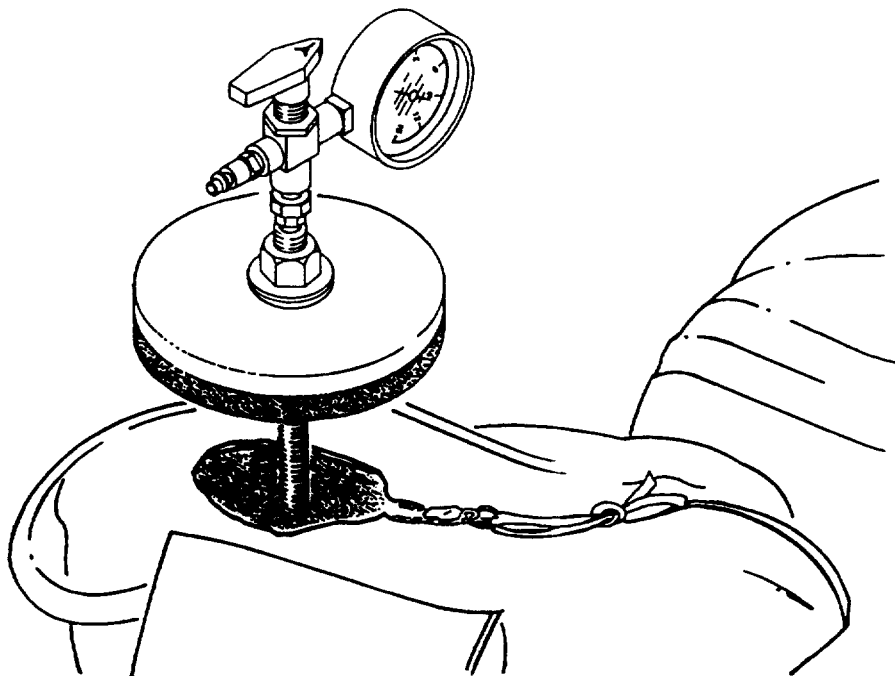


Figure 5-28. Face Plate Assembly (Bottom Plate Inside Suit)

005028

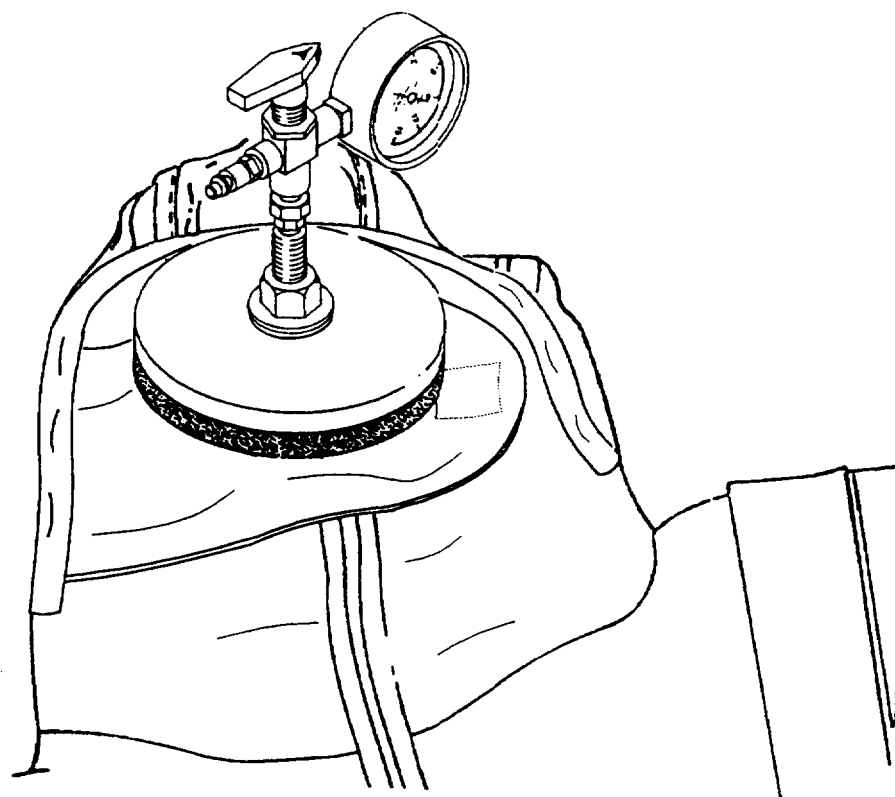


Figure 5-29. Face Plate Assembly (Top and Bottom Plates Fastened Together)

005029

12. Any suit repaired for leakage must be retested in accordance with steps 1 through 5.

5-166. CLEANING. To clean the CWU-60/P coverall, proceed as follows:

1. Hang coverall from a wooden hanger. Close entrance slide fastener.
2. Use 1/4 cup detergent to 3 gallons of water and scrub coverall with a soft non-metal bristle brush.
3. Rinse well with clean water.
4. Leak test in accordance with paragraph 5-165.
5. Open slide fastener and leave coverall hanging in a well ventilated area to dry.



Do not wring or squeeze suit to remove water.

6. After suit is dry, check for cleanliness.

5-167. STORAGE. When placing the CWU-60/P in seasonal storage, proceed as follows:

NOTE

CWU-60/P coverall shall be stored in an area where threat of contamination by fuel/oil is not present and where temperature will not exceed 150°F.

1. Open entrance slide fastener.
2. Close face flap.

Table 5-15. Repairs and Fabrications

Repair/Fabrication	Paragraph
Repairing Snags, Tears, and Punctures	5-169
Repairing Seam Tape	5-170
Repairing Stowage Bag	5-171
Patching CWU-60/P Hood	5-172
Fabricate Reflective Tape Assemblies	5-173
Repair Cinches and Thumb Loop	5-174

3. Confirm that waist, wrist, and ankle cinches are loosened to their maximum length.

4. Hang from wooden coat hanger.

5-168. REPAIRS AND FABRICATIONS. Instructions for performing authorized repairs and fabrications to maintain the CWU-60/P in the Ready For Issue (RFI) condition can be found in the following paragraphs. Only the repairs listed in table 5-15 are authorized.

5-169. REPAIRING SNAGS, TEARS AND PUNCTURES. To repair damaged neoprene foam material, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Toluene	TT-T-548 NIIN 00-579-8431
As Required	Cloth, Nylon Chloroprene Coated Type I, USAF Green No. 1511	MIL-C-19002 NIIN 00-935-1759
As Required	Sheeting, Anti-Exposure Neoprene, 1/8-Inch Thick	NIIN 00-009-0451
As Required	Adhesive, Class 3, Polychloroprene (Not E)	MIL-A-5540 NIIN 00-515-2246
As Required	Coat Hanger	—
As Required	Adhesive, Neoprene Color: Neutral	P/N 1041 NIIN 00-440-5603
1	Hand Roller	GGG-R-00620 NIIN 00-243-9401

Notes: 1. Adhesives may come from supply that contain both a base adhesive and an accelerator. Mixing of the accelerator with the base adhesive is not recommended for use on any items requiring adhesive in this manual. Use only the base adhesive.

WARNING

Do not use toluene near heat, sparks or open flame. Avoid prolonged contact with skin or breathing of fumes. Use only in a well ventilated area.

CAUTION

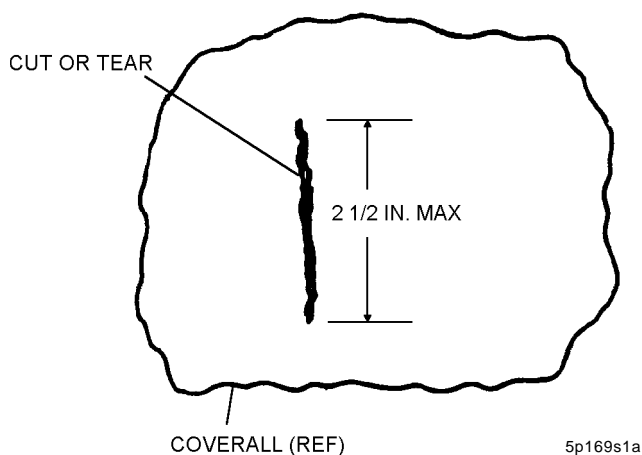
Clean only coated side of cloth with toluene. Toluene may damage equipment if not used with care. Avoid all contact with areas not to be cleaned. Wipe up excess spills immediately.

NOTE

All snags, tears and punctures which do not exceed length limitations shall be cemented as well as patched.

1. Repair of Linear Tears. Linear tears may be repaired if tear does not exceed 2 1/2 inches in length.

a. Measure and ensure tear is 2 1/2 inches or less.



Step 1a - Para 5-169

b. Using MIL-C-19002, cut a rectangular patch with rounded edges 1 inch larger than the damaged area on all sides.

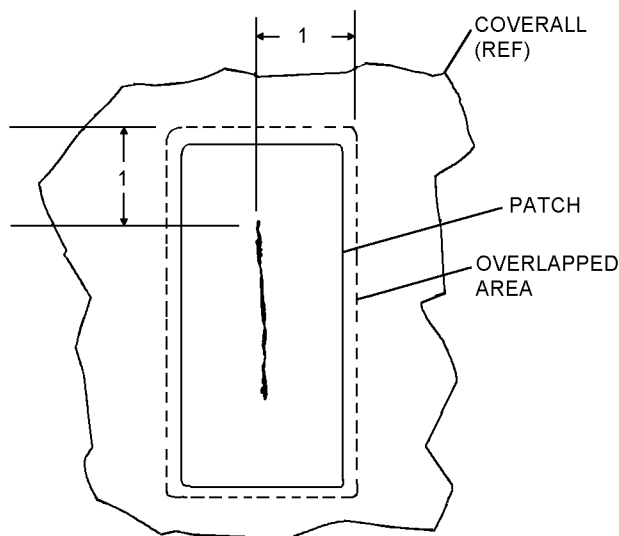
c. Turn coverall inside out and clean patch and area around damage with toluene.

d. Apply three coats of seal adhesive to each side of the linear tear.

e. While the third coat of adhesive is still tacky, butt the torn edges together. Let adhesive dry for about 15 minutes.

f. Apply three coats of MIL-A-5540 adhesive to the coverall and the coated side of the patch, allow adhesive to extend slightly beyond the damaged area. Allow 15 minutes drying time between coats.

g. When last coat is tacky, apply patch to damaged area.



Step 1g - Para 5-169

h. Roll out bubbles with roller.

NOTE

Talcum powder prevents adhesive from bonding. If other areas are to be cemented, avoid getting talcum on those areas. If in doubt about presence of talcum powder, sponge the area with water first and allow to dry before cementing.

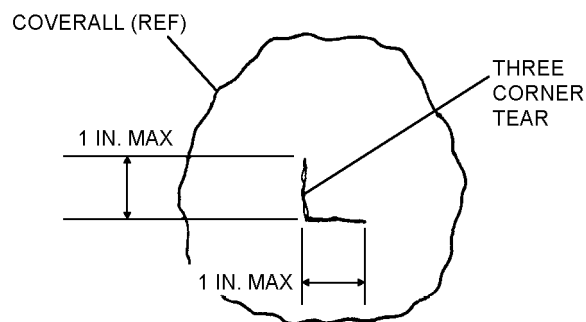
i. Dust cemented area with talcum powder and turn suit right side out.

j. Allow adhesive to cure 48 hours before performing leak test.

k. Perform leakage test in accordance with [paragraph 5-163](#).

2. Repair of Snags and Three Corner Tears. Snags or three corner tears may be repaired if they do not exceed 1 inch in length on the long leg of the tear.

a. Measure and ensure snag is 1 inch or less in length in all directions.



Step 2a - Para 5-169

5p169s2a

b. Using MIL-C-19002, cut a square with rounded corners 1 inch larger than the damaged area in all directions.

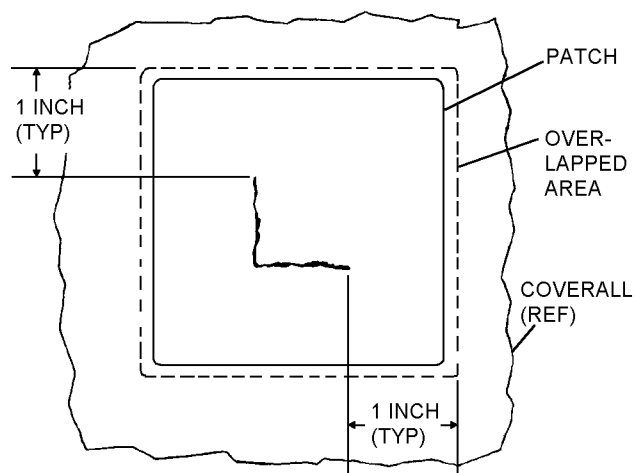
c. Turn coverall inside out and clean patch and area around damage with toluene.

d. Apply three coats of seal adhesive to each edge of the three-corner tear.

e. While the third coat is still tacky, butt the turn edges together. Let adhesive dry for about 15 minutes.

f. Apply three coats of MIL-A-5540 adhesive to coverall and coated side of patch. Allow adhesive to extend slightly beyond the damaged area. Allow 15 minutes drying time between coats.

g. When last coat is tacky apply patch to damaged area.



Step 2g - Para 5-169

5p169s2g

h. Roll out bubbles with wooden roller.

NOTE

Talcum powder prevents adhesive from bonding. If other areas are to be cemented, avoid getting talcum on those areas. If in doubt about presence of talcum powder, sponge the area with water first and allow to dry before cementing.

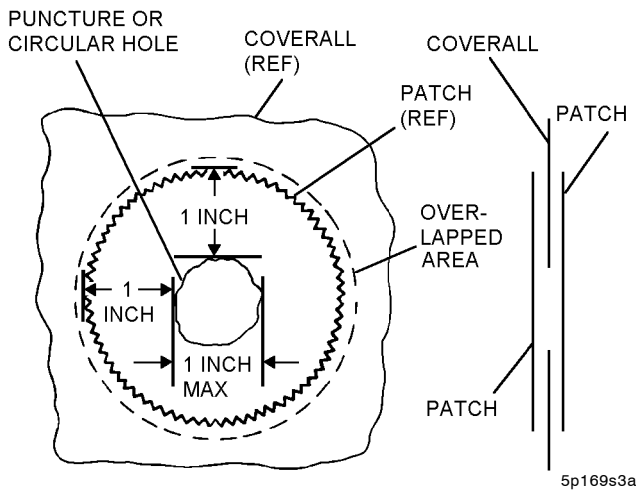
i. Dust cemented area with talcum powder and turn suit right side out.

j. Allow adhesive to cure 48 hours before performing leak test.

k. Perform leakage test in accordance with [paragraph 5-163](#). Verify leak test results, pressure and leakage, if any.

3. Repair of Punctures. Punctures or circular holes may be repaired if they do not exceed 1 inch in diameter.

a. Measure and ensure puncture or circular hole is 1 inch in diameter or less.



Step 3a - Para 5-169

b. Cut two circular patches of MIL-C-19002, one for each side of the fabric. Cut the patches one inch larger than the hole. If the hole is larger than 1/2 inch, cut a plug of neoprene the size of the hole.

c. Turn coverall inside out and clean patch and area around damage with toluene.

d. If a plug is to be used, apply three coats of seal adhesive to the edges of the hole and to the sides of the plug. When the third coat is still tacky, butt the edges of the neoprene together. Let dry for 15 minutes.

e. Apply three coats of adhesive to coverall, and coated side of patch, allow adhesive to extend slightly beyond the damaged area. Allow 15 minutes drying time between coats.

f. When last coat is tacky apply patch to damaged area.

g. Roll out bubbles with roller.

NOTE

Talcum powder prevents adhesive from bonding. If other areas are to be cemented, avoid getting talcum on those areas. If in doubt about presence of talcum powder, sponge the area with water first and allow to dry before cementing.

h. Dust cemented area with talcum powder and turn suit right side out.


i. Apply outside patch in same manner. Dust area with talcum powder.

j. Allow adhesive to cure 48 hours before performing leak test.

k. Perform leakage test in accordance with paragraph 5-163.

5-170. REPAIRING SEAM TAPE (SUPPORTED OR UNSUPPORTED). To recement or replace tape, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	1-Inch Cloth Supported Polychloroprene Tape, Type III	MIL-C-19002 NIIN 00-078-2958
As Required	3/5-Inch Unsupported Polychloroprene Tape, Type III	MIL-C-23926 NIIN 00-045-8113
As Required	Adhesive, Polychloroprene Class 3 (Not )	MIL-A-5540 NIIN 00-515-2246
As Required	Talcum Powder	MIL-T-50036

Notes: 1. Adhesives may come from supply that contain both a base adhesive and an accelerator. Mixing of the accelerator with the base adhesive is not recommended for use on any items requiring adhesive in this manual. Use only the base adhesive.

NOTE

On all repairs, apply three coats of adhesive to both tape and coverall. Allow 15 minutes between coats. When areas are tacky, apply tape (supported or unsupported). Roll entire tape down firmly ensuring any trapped air is forced out. Apply a light coat of talcum powder.

1. If tape is loose and undamaged, recement tape to coverall.

NOTE

When replacing damaged or missing tape ensure replacement tape ends are rounded off.

2. If tape is missing, measure and fit a replacement tape to the area, and cement in place. Overlap tape ends a minimum of 1 inch.

NOTE

If seam being repaired is straight, use the cloth-supported tape. Use the unsupported tape if the seam being repaired is curved. This helps make the application easier. Use care when applying. Do not stretch the tape.

3. If tape is damaged, peel damaged tape from coverall. Replace with new tape. Overlap tape ends a minimum of 1 inch.

4. If seams leak, repair leak and apply new tape to area.

5. Allow adhesive to cure 48 hours before performing leak test.

6. Perform leak test in accordance with paragraph 5-163.

5-171. REPAIRING THE STOWAGE BAG. To repair the stowage bag, proceed as follows:

NOTE

If a damaged area exceeds 6 inches in any direction or if the markings are damaged, procure a new storage bag through supply. P/N 1510AS200-1.

Materials Required

Quantity	Description	Reference Number
As Required	Fabric, Type III Class III	MIL-C-7129 NIIN 01-173-4436
As Required	Thread, Nylon, Size E, Sage Green	V-T-295 NIIN 00-204-3884
As Required	Snap, Nickel, Cap	NIIN 00-276-4953
As Required	Snap, Nickel, Post	NIIN 00-276-4969
As Required	Snap, Nickel, Socket	NIIN 00-276-4946
As Required	Snap, Nickel, Stud	NIIN 00-175-2923
As Required	Webbing, Nylon, Sage Green Type IV, 1 Inch Wide	MIL-T-5038 NIIN 00-261-8579

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch using 7 to 10 stitches per inch with 1-inch minimum backstitching or overstitching.

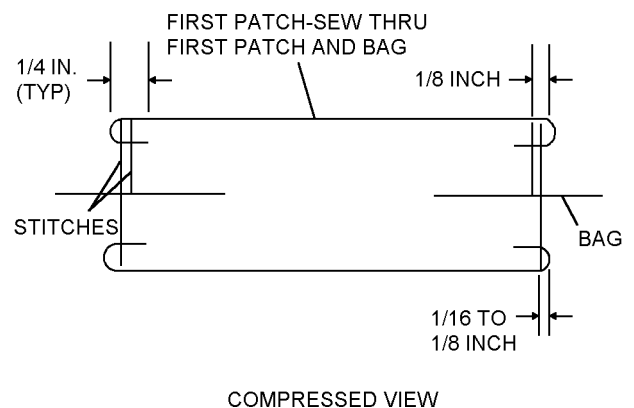
1. Loose or broken stitching shall be repaired by restitching.

2. Small holes and tears, up to 1/2 inch in length or diameter may be mended and/or darned on a sewing machine.

NOTE

To repair holes and/or tears larger than 1/2 inch in diameter or length, use patches.

3. To patch, cut two pieces of cloth at least 1 inch larger than the damaged area in all directions. Turn the edges of first patch under 1/4 inch. Center the patch over the damaged area on inside of bag and sew 1/8 inch from the folded edge. Turn the edges of the second patch under 1/4 inch. Center over damaged area on outside of bag and stitch through all thicknesses 1/8 to 1/16 of an inch from the edge.

**Step 3 - Para 5-171**

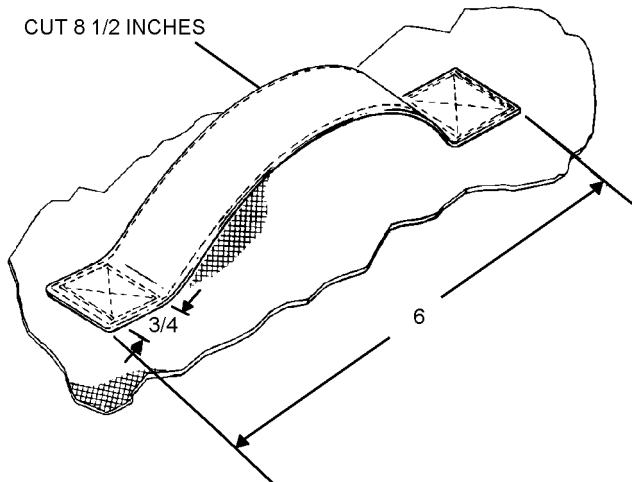
4. To replace snaps, patch damaged areas as shown in [step 3](#). Replace the port on of the missing snap using the snap crimper.

5. If handle of the stowage bag is broken, remove old handle.

NOTE

If the attachment area is damaged, repair in accordance with step 3.

6. If the attachment area is not damaged, cut 8 1/2 inches of 1-inch wide MIL-T-5038 webbing and cross-box stitch onto bag 6 inches apart at the base.



Step 6 - Para 5-171

5p171s6

5-172. PATCHING CWU-60/P HOOD. To apply 2-inch diameter patches or seam tape patches, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Sewing Machine, zigzag single or double throw	—
As Required	Thread, Nylon, Size E, Sage Green, Olive Drab	V-T-295 NIIN 00-204-3884 or equivalent
1	Sealer, heat, seam and patch	MIL-S-85634 NIIN 01-186-7869
As Required	Patch, 2-inch diameter	NIIN 01-192-2489
As Required	Seam Tape, 1 1/2 -or- 7/8-Inch	NIIN 01-193-0469 -or- NIIN 01-189-6361

Materials Required (Cont)

Quantity	Description	Reference Number
1	Hand Roller	GGG-R-00620
1	Torque Wrench 0-100 lb-in	

NOTE

Ensure coverall is thoroughly dry prior to patching. Round off corners of seam tape prior to application. All patching shall extend a minimum of 1/2 inch beyond damaged areas. Patches may be overlapped to achieve this margin. Tears 1/2 inch or greater in length will be closed with zigzag stitching prior to application of patches. Zigzag stitching shall be single or double throw, 5 to 7 stitches per inch (measured on one side of throw), using size E, sage green nylon thread. Width of stitches shall vary with smoothness of the tear.

1. Close tears with Type 301 zigzag machine stitching.

WARNING

Prior to application of seam tape, Aircrew Survival Equipmentman must be familiar with heat sealing machine operating procedures in NAVAIR 17-10DC-1. Do not allow any coverall material threads or sewing machine thread to protrude from under the seam tape.

2. Turn the heat sealer on and wait 10 minutes for the thermometer to stabilize at 300°F. Do not over-heat.

NOTE

Temperature is critical. Do not over-heat. Cement may evaporate/deteriorate.

3. Center the area to be patched on the anvil pad, ensuring only one layer of fabric is on the anvil and there are no wrinkles in the fabric.
4. Center the patch, film side down, on the damaged hood fabric.
5. Lower the heat platen and lock it in place.
6. Smooth out wrinkles and air pockets with a hand roller.

Table 5-16. Types of Repairs on Glove/Mitten Assembly

Type of Damage	Condition	Procedure
1. Tears on glove	1-inch or less in palm area or in the back	Repair by placing a patch on the inside of the damaged area. Refer to para 5-169 .
2. Rips or tears in Mitten Assembly	2 inches or less	Repair by butting damaged areas together with adhesive. Refer to para 5-169 .
3. Wrist pad elastic hold down		Repair as need with (MIL-C-85163) Elastic by box-stitching the replacement elastic onto old remains of hold down. Use essentially the same procedure as para 5-174 .

NOTE

Patches may be overlapped and shall extend at least 1/2 inch beyond the damaged area.

5-173. FABRICATION OF REFLECTIVE TAPE ASSEMBLIES. To fabricate the reflective tape assemblies, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Nylon Thread, Size E, Sage Green, Olive Drab, or Black	V-T-295 NIIN 00-616-0079 or equivalent
As Required	Reflective Sheeting 2-Inch Wide, Silver	NIIN 01-398-6939
As Required	Reflective Sheeting 2-Inch Wide, Red-Orange	NIIN 01-283-7890
As Required	Fastener Tape, Hook Class 2, 2-Inch Wide	NIIN 00-926-4931

1. Select the desired piece of adhesive backed reflective sheeting and cut a piece of Hook Fastener Tape to equal the length of the reflective sheeting.

NOTE

There should be one silver and one red-orange reflective tape assembly on each pile fastener area. (See [figure 5-24](#).)

2. Neatly attach them (reflective sheeting and hook tape) together back to back. Make all corresponding reflective sheeting and hook tape edges aligned with each other.

3. Using Type 301 lockstitch, sew the tape and adhesive backed sheeting together to obtain a stronger permanent attachment. Round the corners to approximately a 1/4-inch radius.

5-174. REPAIRING CINCHES AND THUMB LOOPS.**Materials Required**

Quantity	Description	Reference Number
As Required	Nylon Webbing Type IV	NIIN 00-261-8579
As Required	Nylon Thread, Size E, Sage Green, Olive Drab, or Black	V-T-295 NIIN 00-616-0079 or equivalent
As Required	Bead Cinch	SK23112-1, -2, or -3 Conax Corp, 2300 Walden Ave. Buffalo, NY 14225 or equivalent

1. Repair cinches as follows:

a. Cut off the damaged webbing. Leave as much original material as possible to attach a replacement piece to.

b. Make the replacement webbing long enough to equal the original length of the cinch after loose ends are overlapped and crossbox stitched (1/2-inch crossbox [stitch or larger]) together. (See figure 5-30.)

2. Repair thumb loop as follows:

a. Cut off the worn/damaged nylon webbing. Leave as much old material as possible to attach a replacement piece to.

b. The replacement webbing shall be cut long enough so that the original length of the Thumb Loop can be maintained when the loose ends are overlapped and crossbox stitched. Sear ends of webbing.

5-174A. REPAIR AND REINFORCEMENT OF FACE SHIELD FOR CWU-60/P, QUICK DONNING ANTI-EXPOSURE COVERALL.

NOTE

Due to the inherent weakness of the neoprene face shield fabric, all CWU-60/P Anti-exposure Coveralls shall have this reinforcement procedure completed.

Materials Required

Quantity	Description	Reference Number
As Required	Fabric, Patching (Not 1 and 2)	—
As Required	Adhesive, Polychloroprene (Not 3)	MIL-A-5540 NIIN 00-515-2246
As Required	Talc	MIL-T-55036 NIIN 01-080-9589
As Required	Pencil, Wax Orange Red White Yellow	A-A-87 NIIN 00-268-9483 NIIN 00-282-3375 NIIN 00-240-1525 NIIN 00-264-4612 or equivalent
As Required	Brush, Acid	A-A-289 NIIN 00-514-2417

- Notes:
1. Face shield patching fabric shall be procured at no cost to the requesting activity from: NAWCAD CODE 4.6.3.3, Bldg 2187, Suite 1240 48110 Shaw Road, Unit 5 Patuxent River, MD 20670-1906.
 2. Requesting activities shall provide their return address and quantity required.
 3. Adhesives may come from supply that contain both a base adhesive and an accelerator. Mixing of the accelerator with the base adhesive is not recommended for use on any items requiring adhesive in this manual. Use only the base adhesive.

1. Lay coverall on a flat surface in a well ventilated area, with the head positioned toward the technician with the face shield facing up.

2. Using locally available newspaper, foam, etc., fill the hood of the coverall to provide a smooth surface for applying repair patch.

3. Place repair patch over face shield with the white side toward the coverall face shield, black side up, and trace outline of outer edge patch onto face shield, using chalk or china marking pencil.

4. Using polychloroprene adhesive, coat the surface of the face shield with 2 coats of adhesive.

a. Apply first layer of adhesive in a right to left application.

b. Apply second layer of adhesive in an up and down application. Let dry. See adhesive container for correct drying time.

5. Apply 2 layers of adhesive to the white surface of the repair patch using the procedures noted in step 4a and 4b.

6. Let both surfaces get tacky.

NOTE

In order to properly apply the repair patch, it is recommended that 2 people are used to complete the repair from this point forward.

7. Ensure that the adhesive coated patch does not come in contact with the face shield prior to proper alignment. Start at the top of the face shield and slowly work one side of the repair patch down at a time.

8. Use the previously traced markings on the face shield to aid in proper alignment.

9. After one side of the patch is applied, repeat the process with the other side of the repair patch.

10. Ensure the repair patch is not stretched extensively while applying to face shield.

11. Upon completion of repair, allow the adhesive to cure for a minimum of 24 hours.

12. Document in accordance with OPNAVINST 4790.2 Series.

5-175. PACKING AND FOLDING PROCEDURE.

To pack the CWU-60/P, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Lubricant Stick	Zipperase NIIN 00-999-7548

CAUTION

The CWU-60/P must be completely dry before packing.

1. Lay out all components. Ensure that suit has been dusted with talc and slide fasteners have been treated with Zipper Ease, ZE-2. Run along slide fastener teeth.

2. Open entrance slide fastener fully.

3. Completely deflate coverall and HGU-32/P hood. Cut and sear the ends of a 60-inch length of Type 1 Nylon Cord. Tie one end to the grommet installed in the HGU-32/P Hood using an approximate 2-inch bowline knot. Tie the other end of the nylon cord, in the same manner, to the grommet in the thigh pocket of the coverall.

WARNING

To enable an aircrewmember to don the CWU-60/P easily in an emergency, the suit shall be packed into the carrying case right side out with the entrance slide fastener fully opened.

4. Stow mittens in retaining straps on the sleeves.

5. Secure face flaps on pile patch on back of the hood.

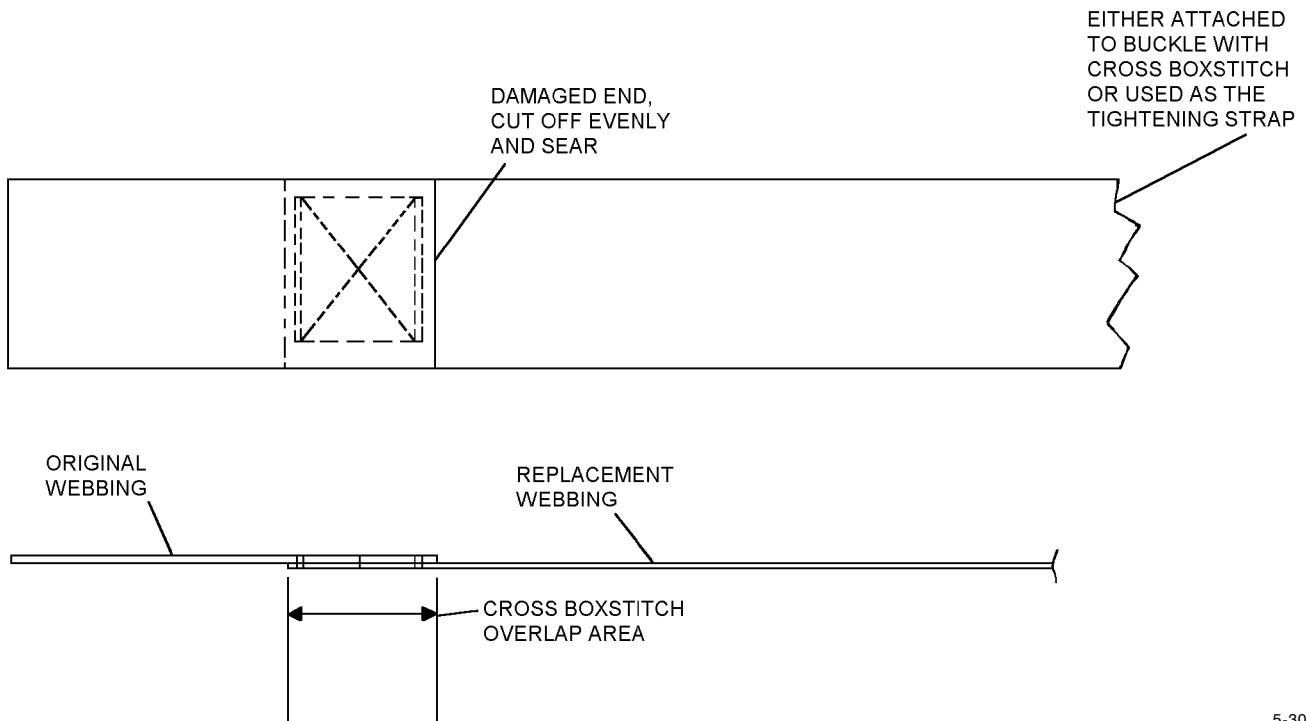
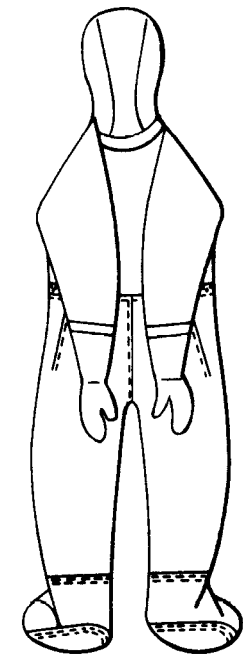
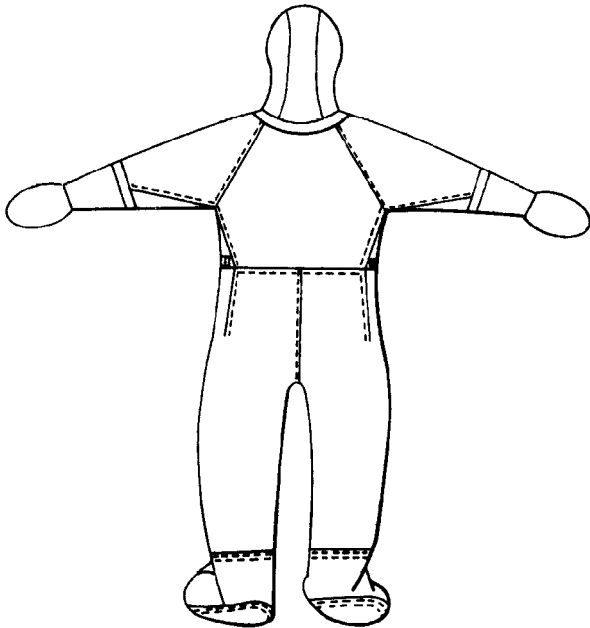


Figure 5-30. Cinches and Thumb Loop Repair

NAVAIR 13-1-6.7-2

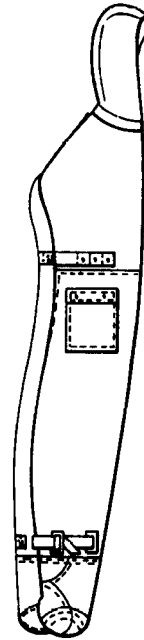
6. With right side out, place coverall face down and fold sleeves across back.



Step 6 - Para 5-175

5p175s6

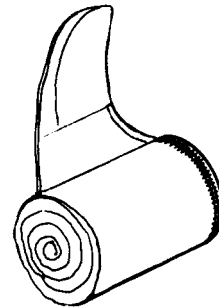
7. Fold the right side of coverall over left. The coverall entrance slide fastener shall be in the full open position. Fold boots flat prior to rolling.



5p175s7

Step 7 - Para 5-175

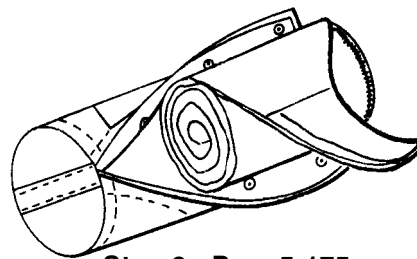
8. Roll coverall tightly, starting with the boots.



5p175s8

Step 8 - Para 5-175

9. Insert coverall into carrying case and snap closed.



5p175s9

Step 9 - Para 5-175

10. The CWU-60/P shall be stowed onboard the aircraft in such a way as to be readily accessible to an aircrewmember.

11. Bunching of suits, stowage near heaters and in places where they will interfere with normal operations shall not be permitted. This practice could damage the suit, preventing it from proper operation. Check current aircraft NATOPS manual for storage instruction.

Section 5-5A. Aviation Rescue Swimmer's Drysuit (ARSD), MSD560 and MSD565

5-175A. GENERAL.

5-175B. Aviation Rescue Swimmer's Drysuit (ARSD) is a commercial off-the-shelf (COTS) open purchase garment used as an outer garment with approved underwear and the is worn underneath (see [Table 5-16B](#) for approved undergarments). The Mustang MSD560 Search and Rescue (SAR) Swimmer's Drysuit ([figure 5-30A](#)) differs from the MSD565 ([figure 5-30B](#)) only in that reflective tape was added to the arms of the MSD565 and the MSD565 comes in 4 sizes instead of just one. All ARSDs shall be maintained in accordance with this section.

5-175C. PROCUREMENT.

5-175D. The ARSD is manufactured at this time by Mustang Survival Manufacturing, Inc. The MSD560 is no longer available for purchase. The MSD565 is procured in four sizes from either Mustang Survival directly (address below) or via the supply system (NIIN [in Table 5-16B](#)).

Mustang Survival USA
3870 Mustang Way
Bellingham, WA 98226
Phone: 360-676-1782
Fax: 360-676-5014
Email: mustangusa@mustangsurvival.com

5-175E. All references to the ARSD shall be Work Unit Code (WUC) 96A3F.

5-175F. Warranty information is available in accordance with [paragraph 5-175Z](#).

5-175G. Repair services are available for the ARSD from commercial sources in accordance with [paragraph 5-175AW](#) and [Table 5-16C](#).

5-175H. Replacement parts are available in accordance with [paragraph 5-175BB](#) and [Table 5-16D](#).

5-175J. CONFIGURATION.

5-175K. The ARSD was designed to meet requirements for in-water rescue operations for SAR Swimmers. The ARSD is composed of a nylon Gortex laminate that prevents water from leaking in, but allows sweat vapor to evaporate and alleviate heat stress and moisture buildup. The ARSD has latex neck and wrist seals, which stretch to fit each of the four sizes - Small, Medium, Large and Extra Large and come with internal suspenders that adjust to accommodate

a range of sizes. The ARSD comes with one-size-fits-all anti-exposure socks factory installed. To expel air trapped in the ARSD, the ARSD is equipped with a self-burping exhaust valve on the top of the lower right arm of the ARSD. To assist in locating the rescue swimmer, the ARSD has reflective tape from the shoulder to the upper arm. To provide durability during helicopter aircrew operations, the ARSD has cushioning in the knee, chest, and underside of the forearm. Abrasion protection is provided at the underside of the arm, top of the boot to the knee, seat area, upper thigh, shoulders and lower leg behind the knee.

5-175L. APPLICATION.

5-175M. The ARSD is worn by aviation rescue swimmers for rescue operations in accordance with NWP 3-50.1.

5-175N. MODIFICATIONS.

5-175P. The ARSD shall be updated by comparing the configuration of the assembly with the directives listed in [Table 5-16A](#).

5-175Q. SIZING.

5-175R. The ARSD shall be properly sized to the aircrewmember based on the height and chest measurements shown in [Table 5-16B](#). Take measurements using the procedure in [Chapter 10](#) with aircrewmember wearing the correct size underwear with liner.

Table 5-16A. ARSD Directives

Modification Description	Application	Modification Code
Check for proper installation of Exhaust Valve	All ARSDs MSD560 and MSD565.	67-1003

Table 5-16B. Sizing Guide for ARSD

Size	Height	Chest	NIIN
Small	62 - 65	36 - 38	01-499-3351
Medium	66 - 69	40 - 42	01-499-3353
Large	70 - 73	44 - 46	01-499-3354
X-Large	74 - 76	48 - 50	01-499-3357

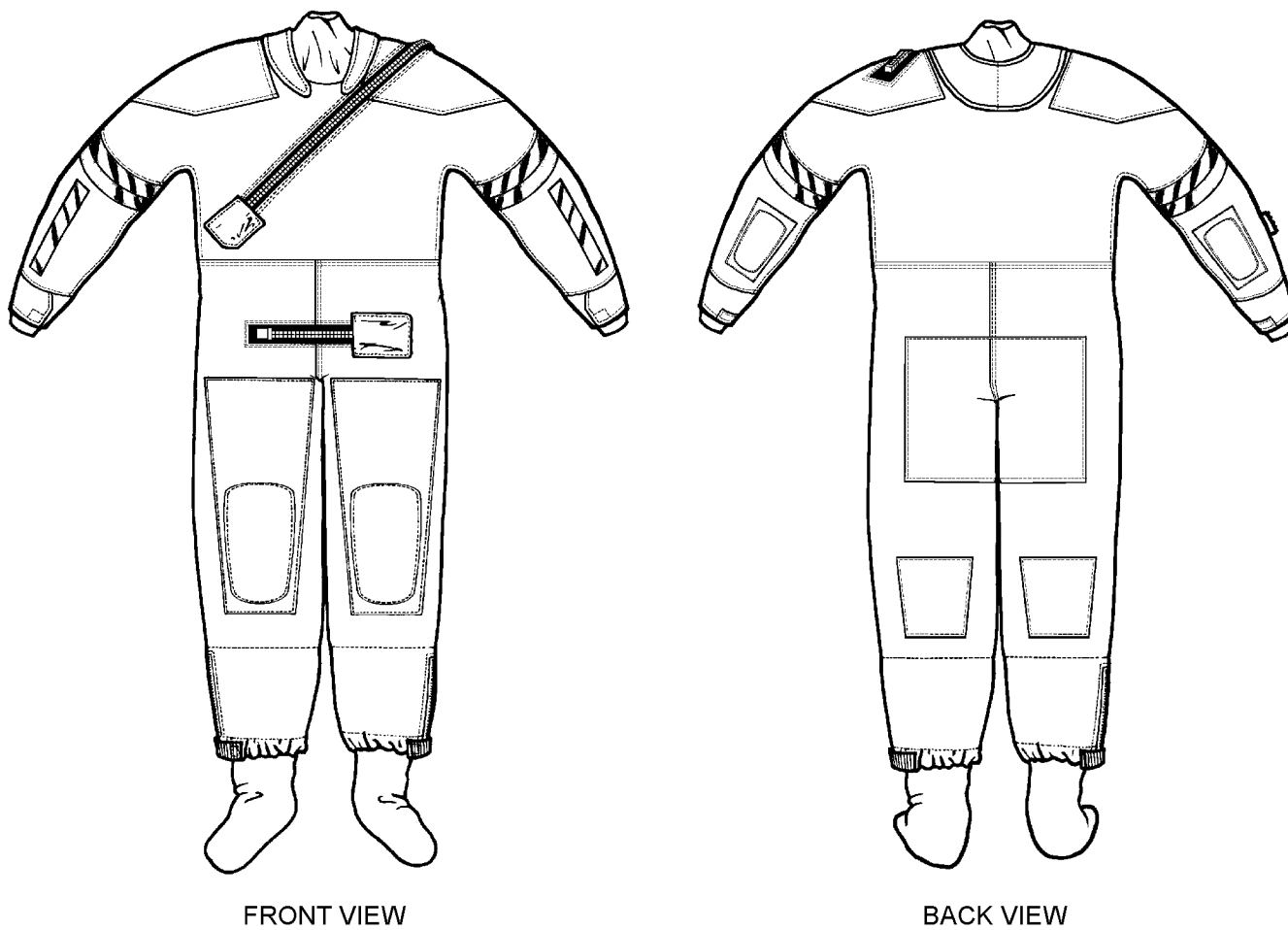


Figure 5-30A. Aviation Rescue Swimmer's Drysuit (ARSD) MSD560

005030a

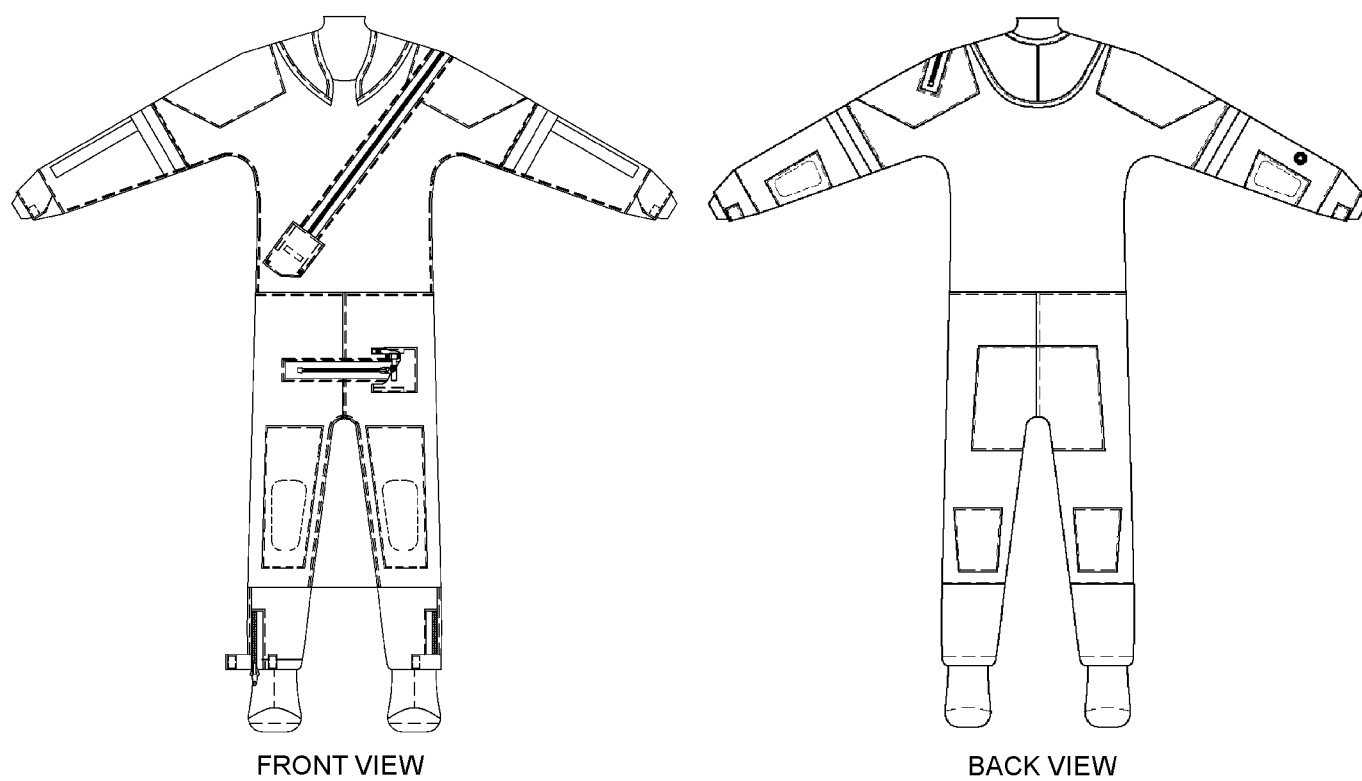
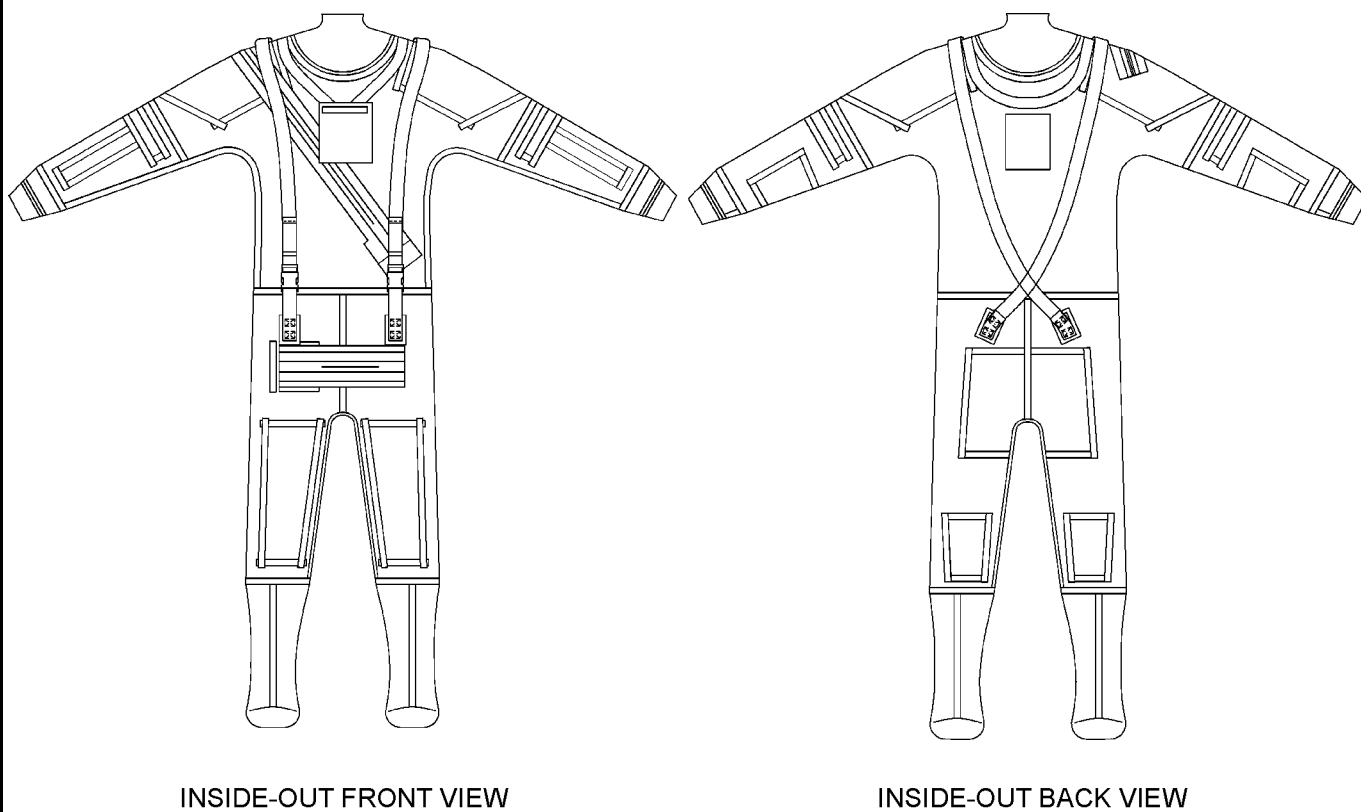


Figure 5-30B. Aviation Rescue Swimmer's Drysuit (ARSD) MSD565 (Sheet 1 of 2)

005030b1



INSIDE-OUT FRONT VIEW

INSIDE-OUT BACK VIEW

Figure 5-30B. Aviation Rescue Swimmer's Drysuit (ARSD) MSD565 (Sheet 2)

005030b2

5-175S. FITTING.

5-175T. ARSD NECK AND WRIST SEALS. The ARSD Neck Seals and Wrist Seals may be trimmed at the initial fitting, but the seals tend to adjust to the wearer after a short period of time. If no excessive seal restriction exists, and seal fit is acceptable to the aircrewmember, the seals should be left as issued. Neck seals shall fit snugly and remain in direct contact with the neck through all normal head movements. Wrist seals shall fit tightly enough to prevent water entry, but not tight enough to restrict blood flow. If seal sizing is required, proceed as follows:



Trim neck seals with extreme caution. A smooth trim line is essential. Excessive or careless trimming could result in loose seals that leak and necessitate expensive replacement at Mustang or Concorde repair facilities. Avoid nicking seal fabric, as this could result in tearing seal when donning and doffing, and also could result in skin irritation.

1. If neck seal trimming is necessary, mark a line around circumference of neck opening. Trimming increments shall not exceed 1/4 inch at a time.

2. Carefully cut along this line with a sharp pair of scissors.

3. Trim wrist seals in same manner as neck seals, except trimming increments shall not exceed 1/8 inch at a time.

4. After trimming seals, have aircrewmember don ARSD to determine seal restriction and water-sealing characteristics. Make any adjustments in accordance with [steps 1 through 3](#).

5-175U. ARSD ANTI-EXPOSURE SOCKS. The ARSD comes from the manufacturer with a pair of one-size-fits-all anti-exposure socks attached. One-size-fits-all socks are expected to fit the most common range of sizes. However, if the aircrewmember being fitted finds the socks either too large or too small, the socks can be removed and replaced in accordance with [paragraph 5-175BF](#).

5-175V. DONNING.

5-175W. Donning of the ARSD shall be in accordance with [paragraph 5-76](#). ~~Intermittent~~ Intermittent suspension of the suit.

5-175X. DOFFING.

5-175Y. Doffing of the ARSD shall be in accordance with [paragraph 5-78](#).

5-175Z. WARRANTY INFORMATION.

5-175AA. Mustang Survival warrants Mustang products to be free from defects in materials and workmanship for one year (12 months) from date of manufacture. Mustang Survival will arrange for shipping defective product back to its factory for repair or replacement and will prepay shipping to have the product returned to the end user. Please contact Mustang before returning product, so that they may arrange the most efficient method to satisfy your requirements. Mustang will issue a Product Return Authorization upon notification. Contact Mustang for any questions about the warranty or to arrange a return. See [paragraph 5-175AX](#) for contact information.

5-175AB. MAINTENANCE.**NOTE**

Quality Assurance (QA) inspection requirements are included in inspection, repair, and replacement procedures. When a procedure is underlined, an authorized QA representative shall verify that the procedure was correctly accomplished before the next step can be performed.

5-175AC. Repair and replacement functions for the ARSD will be accomplished at the Organizational (O-level) and Intermediate (I-level) level or above. Maintenance of the ARSD consists of inspection, cleaning, repair and replacement. All maintenance actions shall be documented in accordance with OPNAVINST 4790.2 Series. In addition, a damage chart shall be maintained for ARSD. The damage chart is intended as an aid to O-Level maintenance technicians in describing needed repairs by I-level personnel. I-level technicians shall use the damage chart as an aid during inspection.

NOTE

ARSD and applicable Undergarments shall be inspected in the same manner as the A/P22P-6 Series assemblies.

5-175AD. MAINTENANCE DOCUMENTS. Documents used to record history and maintenance information consist of those documents described in Chapter 1 of this manual and the CWO-62/P Series cover flap damage chart (figure 5-11, 5-12 and 5-12A). The damage chart is also intended to aid the organizational level custodians of the cover flap in describing other needed repairs to the I-level technicians. It shall be used by the I-level personnel as an aid during inspections. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series.

5-175AE. SERVICE LIFE. ARSD shall remain in service until beyond economical authorized repair.

5-175AF. INSPECTION.

5-175AG. Preflight Inspection. The Preflight Inspection shall be performed by the aircrewmember to whom the ARSD is issued prior to each flight. To perform the inspection, proceed as follows:

- 1. Slide fasteners for proper functioning.
- 2. Seams for loose tape, separation, cuts and tears.
- 3. Neck and wrist seals for damage and proper bonding to the ARSD.
- 4. Socks for proper attachment to ARSD.
- 5. Assembly for cuts, tears, abrasions and deterioration.
- 6. Exhaust valve for tightness and overall condition. Ensure blue flange is visible through the 8 black cap circular vents.
- 7. Reflective tape for loose or separated tape.
- 8. Internal suspenders for condition and wear.

5-175AH. Postflight Inspection. To perform the Postflight Inspection, perform a Preflight Inspection in accordance with paragraph 5-175AG and then proceed as follows:

- 1. Hang ARSD inside out on a wooden or heavy-duty plastic hanger.

- 2. Allow ARSD to air-dry in a cool, dry, well-ventilated area.

5-175AJ. Place-In-Service Inspection. Prior to initial issue of the ARSD to the aircrewmember or when re-issuing after Repair Return from repair facility or when removing from Long Term Storage, a Place-In-Service Inspection shall be completed. The Place-In-Service Inspection is at times an exclusively O-level function and at other times the Place-In-Service Inspection is a joint O-level and I-level effort. The differences are outlined below. To perform the Place-In-Service Inspection, proceed as follows:

5-175AK. Initial Issue Place-In-Service Inspection.

Materials Required

Quantity	Description	Reference Number
1	Laundry Marking Ink	NIIN 00-161-4229

1. O-Level shall:

a. Size/fit ARSD in accordance with paragraphs 5-175Q and 5-175S.

b. Perform 180-Day in accordance with paragraph 5-175AN.

c. Clearly print the Aircrewmembers last name and initials inside the ARSD near the manufacturer's label using Laundry Marking Ink, or indelible ink only.

d. If discrepancies are found during any point in the Place-In-Service Inspections, see Warranty Information in paragraph 5-175Z before attempting any repairs. If warranty has gone beyond its expiration date and no longer applies or the repair needed is beyond the scope of the warranty, perform repairs in accordance with 5-175AW and leak check in accordance with paragraph 5-175AQ.

e. Document Place-In-Service in accordance with OPNAVINST 4790.2 Series. Attach factory certification directly to the OPNAV 4790/159 CARD and place in aircrewmembers personal Aircrew Flight Equipment Record as a permanent part of his historical records.

5-175AL. Place-In-Service Inspection for Repair Return of ARSD from Factory Repair Facility (Mustang or Concorde).

1. O-level shall:

a. Perform 180-Day Inspection in accordance with [paragraph 5-175AN](#) except for step 1 (leak check). If no discrepancies are found during the 180-Day Inspection, and if the factory certification of the RFI status of the ARSD is present, then issue the ARSD directly back to the aircrewmember without leak checking the ARSD. The ARSD was leaked checked at the repair facility during the repair procedures and there is no need to repeat the leak test if no discrepancies are noted during the 180-Day Inspection.

NOTE

If production facility re-certification documenting the repair and leak test does not accompany the ARSD, then the ARSD must be leak checked in accordance with [paragraph 5-175AQ](#) before returning to aircrewmember.

b. If discrepancies are found during any point in the Place-In-Service Inspections, see Warranty Information in [paragraph 5-175Z](#) before attempting any repairs. If warranty has gone beyond its expiration date and no longer applies, or the repair needed is beyond the scope of the warranty, perform repairs in accordance with applicable paragraphs.

c. Document new Place-In-Service in accordance with OPNAVINST 4790.2 Series. Attach factory re-certification directly to the OPNAV 4790/138 card and place in aircrewmember's personal Aircrew Flight Equipment Record as a permanent part of his historical records.

5-175AM. Place-In-Service Inspection for Removal from Long Term Storage.

1. O-Level shall:

a. Have aircrewmember don the ARSD to ensure the ARSD still fits properly in accordance with [paragraph 5-175S](#).

b. Perform all the steps of the 180-Day Special Inspection in accordance with [paragraph 5-175AN](#).

c. Forward the ARSD to I-level for leakage test.

2. I-Level shall:

a. Perform leak check in accordance with [paragraph 5-175AQ](#).

b. Document new Place-In-Service in accordance with OPNAVINST 4790.2 Series.

5-175AN. Special Inspection (180-Day). The 180-Day Special Inspection shall be performed at the O-level, on all in-service ARSD series assemblies upon Place-In-Service and every 180/360 days thereafter. To perform the 180-Day Inspection, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Lubricant Stick	Zipperease NIIN 00-999-7548

1. If required, clean assembly components in accordance with [paragraph 5-175AV](#).

2. Inspect as follows:

a. Place ARSD on a flat, clean surface.

b. Inspect surface of ARSD, wrist seals, neck seals, socks, and reflective tape for damaged fabric, holes and loose or broken stitching.

c. Inspect slide fasteners for damaged chain, loose/missing teeth and stops, improper chain alignment, damaged or split end seal blocks, damaged or mission pull tabs (metal and fabric), and loose/frayed slide fastener tape.

WARNING

If blue flange is not visible through the top cap, then the blue flange is either missing or the valve has been installed backwards. See [paragraph 5-175BC](#) for information on the exhaust valve.

d. Inspect exhaust valve, located on the right sleeve just below the elbow, for tight fit, condition of valve plastic and visibility of blue flange through the black cap 8 circular vent holes. Valve is properly installed if the male portion of the exhaust valve (knurled vented black cap with 8 small top circular vents) is located and visible on the outside of the coverall and the female portion (solid black cap with four vents on the underside stem) is located inside the coverall.

e. Inspect chest pad for damage.

f. Inspect internal suspenders for damaged fabric, holes, loose or broken stitching, damaged or broken buckles, and loose anchor patch.

g. Turn ARSD inside out and repeat steps b and c, and inspect seam tapes for looseness or fraying.

h. Apply a coating of lubricant to slide fasteners using a lubricant stick.

i. Turn ARSD right side out. Inspect slide fastener for proper operation. Inspect overall condition of ARSD.

j. If I-level repairs are necessary, forward ARSD with damage chart (figure 5-11 or 5-12) detailing discrepancies, to I-level for repair and/or further testing.

k. When 360-Day Inspection is required, forward ARSD to I-level for inspection.

l. Document inspection in accordance with OP-NAVINST 4790.2 Series.

NOTE

Authorization is granted at O-level to stitch wrist and neck seals and socks onto the ARSD provided heat sealing and water tests are performed at the I-level.

5-175AP. Special Inspection (360-Day). The Special 360-Day Inspection is performed jointly by O-level and I-level every 360 days as follows:

1. O-level shall perform all steps of the 180-Day Special Inspection in accordance with paragraph 5-175AN.

2. I-level shall perform the water leakage test on the ARSD in accordance with paragraph 5-175AQ.

5-175AQ. Water Leak Test.

NOTE

Water shall not leak out of the exhaust valve during the leak check performed in accordance with paragraph 5-90. If the exhaust valve leaks, the valve is bad, not tightened down snug enough, or the valve is installed backward. Replace bad exhaust valves in accordance with paragraph 5-175BC.

1. Before turning the ARSD inside out for the leak test, visually check that the exhaust valve is installed properly with the male portion of the valve on the outside of the ARSD and the female portion on the inside of the ARSD.

2. Perform leak test in accordance with paragraph 5-90. When the ARSD is turned inside out for the leak test, the male portion of the exhaust valve will now be situated on the inside of the ARSD for the duration of the leak test. There is no need to disassemble the valve during the leak test; the male portion will automatically be in the correct position for the test after the suit is turned inside out.

5-175AR. STORAGE.



The coveralls should be stored in a cool, dark place as prolonged exposure to the sun's ultra-violet rays or other sources of ozone will degrade the adhesives and all types of rubber. Keep coveralls away from gasoline, oil, and other petroleum products as they dissolve adhesives.

Do not insert hanger through neck seal opening when preparing coveralls for short term storage. Ends of hangers could puncture and damage the neck seal. Insert hanger through entry zipper and push hanger head from below through the neck seal opening.

5-175AS. Short Term Storage. Between flights, ARSD shall be hung on a heavy-duty plastic or wooden hanger or folded in accordance with figure 5-15, and stored in a clean, well-ventilated, protected area.

5-175AT. Seasonal Storage. Seasonal storage is storage during the warmer months when anti-exposure protection is not required for flight. ARSD in Seasonal Storage shall be maintained on its normal 180/360-day inspection cycles and do not require a new place in service inspection upon removal from seasonal storage. Seasonal Storage does not require documentation as "Seasonal Storage".

5-175AU. Long Term Storage. ARSDs being stored, rather than being maintained on a 180/360-day inspection cycle, (for whatever reason) shall be considered in Long Term Storage. An ARSD that has gone beyond either its 180-Day or 360-Day Inspection shall be considered out of service and in Long Term Storage and must be documented as such. ARSDs being removed from Long Term Storage shall have a Place-In-Service Inspection completed and documented. To place the ARSD in Short or Long Term Storage, proceed as follows:



ARSD should be stored in a cool, dark place as prolonged exposure to the sun's ultra-violet rays or other sources of ozone will degrade the adhesives and all types of rubber products (latex, neoprene). Keep ARSD away from gasoline, oil and other petroleum products as petroleum dissolves the cement.

1. Ensure that ARSDs are clean and completely dry.
2. Close slide fasteners on ARSDs to within 4 inches of end seal blocks.
3. Fold ARSDs in accordance with figure 5-15. Place ARSDs in individual plastic bag and clearly label with aircrew member's name.
4. Loosely pack bagged ARSDs in storage bins, cruise boxes or other appropriate storage containers.
5. Store closed containers in a cool, dry area.

5-175AV. CLEANING. Clean in accordance with paragraph 5-93.

5-175AW. REPAIRS AND FABRICATIONS. Instructions for performing repairs, replacement or fabrications of the assembly shall be limited to those listed in tables 5-8, 5-16C and 5-16D and paragraphs 5-175AW through 5-175BV. All repairs shall be verified by RFI with the leakage test in accordance with paragraph 5-175AQ after repairs.

5-175AX. ARSDs are purchased with a warranty as outlined in paragraph 5-175Z. Before attempting any repairs of the ARSD, check its warranty. All ARSD repairs being performed at commercial repair facilities shall be reported to NAVAIR Fleet Support Team (FST) via Naval Message. Send message reporting a) Repairs completed and b) final cost of the repairs to COMNAVAIRWARCENACDIV PATUXENT RIVER MD//4.6.8.3//. The cost of repairs shall not exceed

50% of cost of ARSD. The only repair facility authorized to do repairs on the ARSD is:

Mustang Survival Mfg. Inc.
222 Juliana Street
Elizabeth, WV 26143
Tel: (304)-275-3306

5-175AY. Commercial repair services are listed in table 5-16C. At this time, the neoseal shall be replaced at a commercial repair facility in accordance with paragraph 5-175BD. All other repairs can be accomplished in accordance with this section by O- and I-level aircrew survival equipmentmen. The services listed are provided for extreme circumstances such as no I-level support, material shortages (e.g. slide fasteners), etc. Table 5-16C lists repairs and a cost range of repairs available from the commercial repair facility.

5-175AZ. The repair facility requires a Base Inspection be accomplished upon receipt/return of the ARSD in order to warranty the repair. The Base Inspection is not accomplished as part of the repair, but is a separate cost that must be factored into the decision about the most cost effective way to deal with repairs/replacement of the ARSD. The inspection covers an initial leak test upon receipt to establish the condition of the ARSD, a second test to confirm all repairs were completed properly, and a certification that the ARSD is free of leaks prior to leaving the facility. Any leaks found in the ARSD will be repaired at a cost to be determined by the repair facility depending on the extent of the repairs involved.

NOTE

ARSDs sent for factory repairs shall be removed from service first and have a Place-In-Service Inspection upon return. Document both actions in accordance with OPNAVINST 4790.2 Series.

5-175BA. Deleted.

5-175BB. Table 5-16D lists ARSD replacement parts which are available from Mustang Survival.

5-175BC. Removal and Replacement of Exhaust Valve. The exhaust valve is a one-way check valve that allows air inside the ARSD to be vented out while preventing water entry when swimmer is in the water. The exhaust valves are designed to be easily replaceable.

NOTE

The exhaust valve is comprised of four (4) major pieces: (1) A knurled black cap with 8 small top circular vents (blue flange visible through the 8 holes) with a threaded stem on the underside (male portion) (2) A solid black cap with four vents on the underside stem (female portion) (3) Rubber gasket and (4) Rubber gasket (rubber gaskets are identical and interchangeable). Number (1) above, the male portion of the exhaust valve can be further broken down into (1) cap piece (knurled black cap with 8 circular vent holes) (2) Blue flange (3) Threaded stem assembly that the blue flange attaches to and sits in. When removing and replacing the exhaust valve, if the cap piece and the threaded stem assembly becomes separated, simply twist cap piece clockwise onto the threaded stem and tighten until snug; do not over tighten and do not remove the blue flange.

1. To remove the exhaust valve, proceed as follows:

a. Locate the exhaust valve on the right sleeve just below the elbow.



Process of removing exhaust valve is untwisting and removing by hand. However, if non-RFI valve is hard to remove by hand use large pliers on the male portion to remove the valve. Thread damage as a result of removal is not a concern because the valve is to be discarded. Be sure not to pinch and damage the fabric of the ARSD during the process.

b. To access the underside of the exhaust valve, open and enter the ARSD through the front entry slide fastener. Insert hand down through the right sleeve and firmly grasp and hold the female portion of the exhaust valve.

c. Grasp the male portion of the exhaust valve and twist counter-clockwise until valve is loosened enough to remove.

d. Once the exhaust valve is completely removed from the sleeve of the ARSD, discard all 4 pieces.

2. To install new exhaust valve, proceed as follows:

NOTE

The exhaust valve is installed properly if the male portion of the valve is visible on the outside of the ARSD. The solid black cap with four vents on the underside stem is the female portion of the valve and is located on the inside of the ARSD.

a. Twist apart new valve keeping one rubber gasket with the outer male portion and one with the inside female portion.

b. Enter ARSD through the front entry slide fastener and down through the right sleeve. Place the female portion (solid cap) and rubber gasket on the inside of the ARSD so that the rubber gasket is layered between the garments' fabric and the cap. Center the assembly in the hole of the sleeve.



Over tightening may cause damage to the exhaust valve threads. When installing, hand tighten with enough force to ensure a proper seal, but not so much that the valve is damaged.

c. Place remaining rubber gasket over the front side of the sleeve hole. While holding bottom cap firmly, twist the male portion clockwise until hand tight. Use enough force to ensure a proper seal, but not so much that the valve threads are damaged.

3. Perform leak check in accordance with [paragraph 5-175AQ](#).

4. Document maintenance action in accordance with OPNAVINST 4790.2 Series.

5-175BD. Replacement of Neck Seal. Replacement of the neck seal can only be accomplished by an authorized repair facility. See [table 5-16C](#) for more information.

5-175BE. Replacement of Wrist Seals. Wrist seals can be replaced with the wrist seals found in [table 5-10](#). Select and install correct wrist seal in accordance with [paragraph 5-108](#) as a guide.

NOTE

O-level is authorized to stitch wrist seals and socks onto the ARSD provided heat sealing and water tests are performed at I-level.

5-175BF. Replacement of Anti-Exposure Socks. Anti-exposure socks can be replaced with the one-size-fits-all black socks listed in [table 5-16D](#) or the CWU-75/P socks found in [table 5-7](#). Both types of socks shall be replaced in accordance with [paragraph 5-105](#). The CWU-75/P comes in 13 sizes and shall be fitted in accordance with [paragraph 5-69](#).

5-175BG. Repair of Slide Fasteners. Repair slide fasteners in accordance with [paragraph 5-100](#).

5-175BH. Replacement of Slide Fasteners. Slide fastener replacement shall be in accordance with [paragraph 5-101](#) using slide fasteners in [table 5-16D](#).

NOTE

Measure chest slide fastener to determine appropriate length (24 to 32 inches depending on the size of the ARSD being repaired). Length is measured from zip stop to zip stop (length of teeth).

5-175BJ. Slide fasteners, part number 110-1731, can be open purchased from OEB Inc. State the length of the slide fastener you need, 8 inches for the relief portal slide fastener and from 24 to 32 inches on the entry slide fastener depending on the size of the ARSD. See [table 5-16D](#) for more information.

5-175BK. Replacement of Loose or Missing Hook and Pile Tape.

5-175BL. Replacement of loose hook and pile tape on the wrist and ankle closures as well as the zipper toggle securing flap shall be accomplished using standard sewing procedures.

5-175BM. Replacement of pile tape located directly on the ARSD to hold the zipper toggle securing flap against the body of the ARSD breaks the integrity of the suit and shall be accomplished as follows:

1. Remove damaged hook tape from ARSD, being careful not to damage ARSD fabric.

2. Cut correct length of hook fastener tape. Position hook tape on ARSD, using original stitching lines as a guide. Attach hook tape to ARSD with a single row of stitching, 1/8-inch from edge on all sides.

3. On inside of ARSD, apply seam tape over stitching lines in accordance with [paragraph 5-104](#).

4. Leak test in accordance with [paragraph 5-175AQ](#).

5. Document in accordance with OPNAVINST 4790.2 Series.

5-175BN. Replacement of Slide Fastener Toggle Pulls. Obtain toggle pull from Mustang as listed in [table 5-16D](#) or replace with fabricated thong in accordance with [paragraph 5-101](#).

5-175BP. Replacement of Loose or Missing Reflective Tape. Use standard cementing procedures to replace or reattach loose or missing reflective tape. NIIN for the 3M 8910 Reflective Tape is 00-481-3424.

5-175BQ. Repair of Fabric Body. Repair fabric body in accordance with [paragraph 5-97](#) and [paragraph 5-116](#) and [table 5-8](#). Repairs will be made from the same material as used on the CWU-62/P Series coveralls. Although the materials of the ARSD and the CWU-62/P are not the same they are compatible and since patches are applied on the inside of the ARSD the matching colors is not important.

5-175BR. Repair of Internal Suspenders. Repair internal suspender by replacing worn/damaged elastic and plastic buckles.

NOTE

When replacing worn/damaged the elastic, do not remove the anchored patch piece that attaches the suspenders to the ARSD. If anchored patch becomes loose or damaged, replace in accordance with [paragraph 5-175BT](#) or [5-175BU](#).

5-175BS. Replacement of Internal Suspender Elastic. To replace internal suspender elastic, proceed as follows:

1. Mark and cut new piece of replacement elastic adding 2 inches to the length needed for a box stitch on the end of the repair. See [table 5-16D](#) for information on the type of elastic to use in the repair.

2. Remove worn or broken elastic by cutting elastic just below the point of wear/damage. Attach new replacement piece to old elastic, overlapping 1 inch.

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3. Stitch the two pieces together with a 3/4 inch box stitch.

4. Perform leak check in accordance with paragraph 5-175AQ.

5. Document maintenance action in accordance with OPNAVINST 4790.2 Series.

5-175BT. Repair of Internal Suspenders Anchor Patch. Use standard cementing procedures to repair loose internal suspenders anchor patch.

5-175BU. Replacement of Internal Suspenders Anchor Patch. Internal suspenders are anchored inside the ARSD with a patch cemented directly on to the fabric of the ARSD (it is not sewn on). Internal suspenders are sewn to the patch and then the patch is cemented to the fabric of the ARSD. Replace internal suspenders anchor patch as follows:

1. Carefully remove suspender elastic from the anchor patch.

2. Measure and cut a 4-inch long by 2-1/2 inch wide anchor patch from polyurethane coated cloth ([table 5-16D](#)).

3. Sew the elastic of the internal suspenders to anchor patch with two separate box stitches using the original anchor patch and suspenders as a guide for placement of the elastic on the new anchor patch.

4. Attach anchor patch to ARSD in the same spot that the anchor patch was previously attached. Use standard cementing techniques to apply new patch to the inside of the ARSD.

5. Perform leak check in accordance with paragraph 5-175AQ.

6. Document maintenance action in accordance with OPNAVINST 4790.2 Series.

5-175BV. Replacement of Damaged Buckle. To remove and replace a damaged buckle, use standard sewing techniques. See [table 5-16D](#) for more information on the buckle.

Table 5-16C. Repair Facility Services and Costs

ARSD (Note 1)		Mustang (Note 2)		
	Where is repair accomplished?	Repair?	Price (Notes 3 and 4)	Parts/Labor
Base Inspection (Note 6)	Commercial repair facility only	Yes	\$70	Labor
Final Processing Inspection	Commercial repair facility only	No	—	—
Neck Seal Replacement	Commercial repair facility only	Yes	\$77	Both
Wrist Seal	In accordance with paragraph 3-175BE or at commercial repair facility	Yes	\$35	Both
Wrist Seal (2)	In accordance with paragraph 3-175BE or at commercial repair facility	Yes	\$68	Both
Sock	In accordance with paragraph 3-175BF or at commercial repair facility	Yes	\$55	Both
Sock (2)	In accordance with paragraph 3-175BF or at commercial repair facility	Yes	\$110	Both
Entry Zipper Replacement	In accordance with paragraph 3-175BH or at commercial repair facility	Yes	\$190	Both
Relief Zipper Replacement	In accordance with paragraph 3-175BH or at commercial repair facility	Yes	\$108	Both
Tear/Hole (Jagged, less than 3")	In accordance with paragraph 3-175BQ or at commercial repair facility	Yes	\$55	Both
Tear (Straight, less than 4")	In accordance with paragraph 3-175BQ or at commercial repair facility	Yes	\$13	Both
Pinholes (up to 3)	In accordance with paragraph 3-175BQ or at commercial repair facility	Yes	\$21	Both
<p>Notes: 1. Before any repairs are conducted on the ARSD, see the Warranty Information in paragraph 3-175Z to see if the original warranty from Mustang will cover the cost of the repair. Repairs done at both facilities are warrantied; make sure to keep all original paperwork with the ARSD History Card to ensure proof of repair so that the warranty will be honored if the repair works should fail during the warranty period.</p> <p>2. Repair prices do not include freight charges.</p> <p>3. All prices are approximate as of the publishing date of this section, and will change over time.</p> <p>4. Mustang will contact requesting activity if needed repairs are beyond the scope of the initial repair requested. Activities must give repair facilities a current and easily accessible POC for decisions authorizing or rejecting the repairs involved and the prices quoted.</p> <p>5. A Base Inspection is required for the ARSD to be certified as leak free when the ARSD leaves the factory. ARSDs that have the Base Inspection done will have a written re-certification accompany the ARSD when returned. Original, and re-certifications must be kept in the aircrewmember's personal Aircrew Flight Equipment Records as a permanent part of his historical file.</p> <p>6. Parts are not included; activity must send sock/socks with ARSD for repair.</p>				

Table 5-16D. Parts List

Nomenclature	Part Number/NIIN	Cost	Contact Information
Sock	MA8831	\$31	Mustang Survival - 304-275-3306
Chest Pad	MA8832	\$8	Mustang Survival - 304-275-3306
Red Toggle	HD7711	\$1	Mustang Survival - 304-275-3306
Exhaust Valve	HD7017	\$28	Mustang Survival - 304-275-3306
Entry Slide Fastener, Size 24 (Not E1 and 2)	110-1731-24	\$87.11	(Not E13)
Entry Slide Fastener, Size 26 (Not E1 and 2)	110-1731-26	\$89.23	(Not E13)
Entry Slide Fastener, Size 28 (Not E1 and 2)	110-1731-28	\$91.35	(Not E13)
Entry Slide Fastener, Size 30 (Not E1 and 2)	110-1731-30	\$93.68	(Not E13)
Entry Slide Fastener, Size 32 (Not E1 and 2)	110-1731-32	\$96.02	(Not E13)
Relief Slide Fastener, Size 8 (Not E1 and 2)	110-1731-8	\$68.03	(Not E13)
Side Release Buckle	None (Not E14)	Varies	YKK
Reflective Tape	00-481-3424	Varies	Supply System
Internal Suspenders Elastic, Black	None (Not E15)	Varies	—
Internal Suspenders Anchor Patch Material, Cloth, Coated Polyurethane	01-335-3129 or equivalent	Varies	Supply System
<p>Notes:</p> <ol style="list-style-type: none"> 1. Comes with red pull toggle attached to slide fastener. 2. Length (or size) of the slide fastener is measured from zip stop to zip stop (length of teeth). 3. To open purchase slide fasteners, contact YKK Inc. via Diversified Marketing Group. Please keep in mind that the individual contact person may change from time to time but the basic contact information is consistent and you will be able to open purchase the slide fasteners in Table 5-16D from the contact information provided. Call Julie A. Murray, Diversified Marketing Group, 109 Forrest Avenue, Narberth, PA 19072. Telephone number: 610-667-5589. Fax number: 610-667-4666. Email: Julie@dmgroup.org. 4. 1 1/2 inch Side Release Buckle is made by YKK USA INC and is LBRU UL approved. Buckles are not available directly from the YKK nor are they in the supply system, but they can be found via the internet and in fabric and craft stores. The cost varies greatly from place to place (e.g. \$.38 to \$15 for one). Do research for the best price. If buckles cannot be obtained locally, contact the NAVAIR Fleet Support Team 13-1-6.7-2 manual manager at 301-342-8379 as limited supplies of buckles are on hand with the clothing team. 5. Elastic used in manufacturing the internal suspenders is 38mm CAM 4192 Black Elastic 100% polyester, woven. 			

Section 5-6. Deleted

Paragraphs 5-176 thru 5-188 Deleted

Figure 5-31 Deleted

Section 5-7. Anti-Exposure Hood

5-189. GENERAL.

Paragraphs 5-191 thru 5-207 Deleted

5-190. The Anti-Exposure Hood is no longer being procured. Any of these hoods left in the system shall be inspected in accordance with HGU-32/P.

Figure 5-32 Deleted

Table 5-17 Deleted

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Section 5-8. HGU-32/P Anti-Exposure Hood

NOTE

The HGU-32/P Anti-Exposure Hood has been moved to [Section 3-17A](#).

Paragraphs 5-208 thru 5-224 Deleted

Figure 5-33 Deleted

Section 5-9. HAU-12/P Anti-Exposure Mittens

NOTE

The HAU-12/P Anti-Exposure Mittens have been moved to [Section 3-27A](#).

Paragraphs 5-225 thru 5-241 Deleted

Figure 5-34 Deleted

Pages 5-91 thru 5-92 Deleted

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Section 5-10. Leak Test Fixtures

5-242. GENERAL.

5-243. Leak test fixtures and seal clamps, not stocked in the supply system, must be assembled locally. Items not available through normal supply channels shall be purchased locally, or fabricated at the organizational maintenance level or above.

5-244. CONFIGURATION.

5-245. TEST FIXTURES. Test fixtures are comprised of various connectors, couplings, seal clamps and adapters with attendant shutoff valves necessary to introduce and regulate a source of pressure into a bladder or cell. A measuring device must be provided to measure initial pressure and leakage (pressure drop).

5-246. WRIST SEAL CLAMP. To fabricate wrist seal clamps for testing. See [figure 5-35](#).

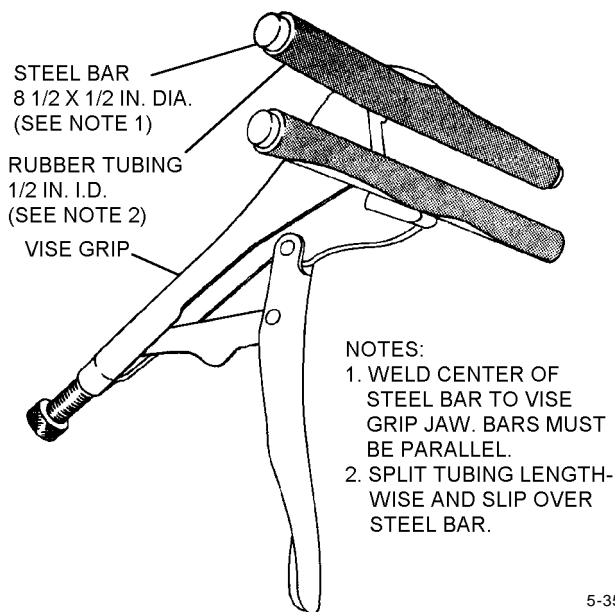


Figure 5-35. Wrist Seal Clamp

5-35

NOTE

1/8-inch thick steel strips, (two for each clamp) may be substituted. Clamp with C-clamps or vise grips.

5-247. LEAK TEST FIXTURE. The leak test fixture shown in [figure 5-36](#) is a basic fixture that can be adapted to most items of equipment and test requirements by substituting the connector (adapter). Refer to [figure 5-36](#). Basic operating instructions are as follows (refer to applicable section for specific instructions):

1. Attach the device to a source of low pressure air.

2. Select the proper adapter, and install on outlet hose. Ensure adapter is clamped on hose, and is leak tight.



Inflate test item slowly, making frequent stops to check pressure.

3. Attach adapter to test item. Rotate 3-way valve to air source and inflate test item. Rotate valve to manometer and read pressure. Repeat as necessary until proper pressure is attained.

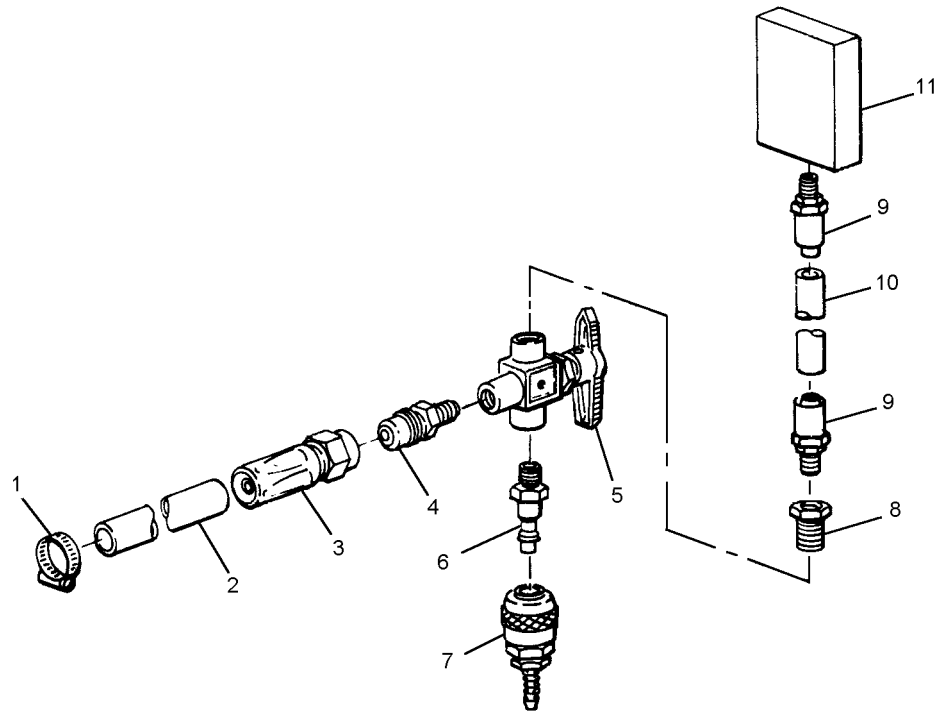


Figure 5-36. Anti-Exposure Leak Test Fixture

5-36

Figure and Index Number	Part Number	Description	Units Per Assembly	Usable On Code
		1 2 3 4 5 6 7		
5-36	No Number	TEST FIXTURE, Anti-Exposure Hood	1	
-1	5415L	. CLAMP, Hose, size 16 (39428)	1	
-2	No Number	. HOSE, Rubber, 1/2 in. ID, 3/4-in. OD	A/R	
-3	MS27404-8D	. FITTING, Hose	1	
-4	AN816-4-8D	. REDUCER, 3/4 in. Tubing to 1/2 in. pipe	1	
-5	B-43XVF4	. VALVE, 3-way with vent (12623)	1	
-6	MIL-C-4109	. COUPLING, Air hose (male) (Note 1)	1	
-7	MIL-C-4109	. COUPLING, Air hose (female) (Note 1)	1	
-8	No Number	. REDUCER, 1/2 to 1/8	1	
-9	851062	. ADAPTER, Hose (08395)	2	
-10	486062	. HOSE, Rubber, 1/2 in. OD (08395)	A/R	
-11	10AA25WM	. MANOMETER, U-Tube, 15 in. range (39739)	1	
Note:		1. Select quick-disconnect coupling compatible with local low pressure air installation.		